Report of an Independent Audit of Forest Management on the Nighthawk Forest for the Period 2003 to 2008

FINAL REPORT

December, 2008

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1.0 EXECUTIVE SUMMARY

A team of five independent auditors carried out an independent audit of forest management on the Nighthawk Forest (NHF) covering the period from April 1, 2003 to March 31, 2008. The NHF has been managed through this period by AbitibiBowater under the auspices of a 20-year forest management plan (commencing April 1, 2003 and set to expire March 21, 2023) with the Ontario Ministry of Natural Resources (OMNR). The audit examined the Company's compliance with the terms and conditions of this agreement and reviewed the OMNR's performance in meeting its obligations on the NHF. The audit included an extensive review of the plans and records of forest management activities, along with field verification visits to areas where a variety of forest management activities occurred during the audit period. Public input was solicited through a public mailing, newspaper advertising, and mail-in surveys.

The NHF was created in 2003 when the former Driftwood Forest, Timmins Forest, and Timmins Management Unit were merged. AbitibiBowater has done a particularly good job of managing this merger. Operational information from three different forests and two different organizations was analyzed and consolidated effectively.

This audit report identifies 13 recommendations aimed at improving the management and administration of the NHF.

The audit has three recommendations aimed at improving planning functions on the NHF. The terms of reference for the Local Citizens' Committee need to be updated to meet the requirements of the 2004 Forest Management Planning Manual. Two other recommendations require OMNR to improve performance of their review and approval functions in the planning process.

The audit has six recommendations aimed at improving the effectiveness of harvest and silviculture operations. Three of these specifically address technical operations and are viewed by the audit team as the most significant findings.

The audit recommends AbitibiBowater and OMNR review the management of water crossings on the NHF. The audit team encountered five water crossings on the forest in need of repair. Each of the crossings in question appeared to have been compromised for a period of time.

Some poplar stands on the NHF were depleted by an unusually intense forest tent caterpillar infestation. These stands are not regenerating satisfactorily and the audit has recommended that corrective action be taken.

The audit also recommends the Company explore further options for reducing roadside slash in winter harvest areas. These areas are very difficult to access other than at the time of harvest, and winter operations are demanding. The auditors acknowledge response to this recommendation will be challenged by the limited time frame of winter operations and by the cost of improving performance.

Other operational recommendations address procedural weaknesses. AbitibiBowater has been asked to improve its performance at matching harvest practices to silvicultural ground rules. They have also been asked to increase the monitoring effort of their aerial tending program to ensure any misapplication is reported more quickly. The auditors also recommended that the Company improve the reporting performance of its tree improvement activities, in order to be compliant with Forest Management Planning Manual requirements.

The auditors found that both the Company and OMNR compliance programs were effective. The Company was very efficient in reporting issues of non-compliance. However, timelines for submitting more routine reports that simply confirmed compliance did not meet submission requirements as regularly.

AbitibiBowater has conducted an effective survey to assess its forest renewal program. With the exception of the surprising case of the poplar renewal noted above, the silvicultural program was found to be highly effective. Having said that, the process used to report the results of successful free-to-grow surveys was not in full compliance with the requirements of the Forest Management Planning Manual.

The audit confirms that this is a well-managed forest. Technical aspects of forest management are completed in a highly satisfactory manner. Communication between the various stakeholders on the forest is very strong and relations are professional, positive, and progressive. AbitibiBowater is satisfactorily meeting all of the terms and conditions of the Sustainable Forest Licence. The OMNR is also meeting its overall responsibilities associated with its role in managing this forest. The audit team confirms that, based on the evidence reviewed, management of the NHF was in compliance with the legislation, policy, and regulations that were in effect during the 2003-2008 audit term. The NHF is being managed sustainably. The audit team has recommended that the term of the Sustainable Forest License be extended for an additional five years.

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2.0 INTRODUCTION

An independent forest audit of the Nighthawk Forest (NHF) was undertaken in the autumn of 2008 to ensure that forest management activities were carried out in accordance with the plans, guidelines, regulations, and legislation in force during the five years from April 1, 2003 to March 31, 2008. This audit was conducted in compliance with the *Crown Forest Sustainability Act* (CFSA) (Statutes of Ontario 1994) and fulfills the requirements of the *Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario* (Ontario Ministry of Environment and Energy 2003). The audit assessed the effectiveness of forest management activities in achieving the management objectives for the NHF. The audit examined the compliance of AbitibiBowater Inc. with the terms and conditions of its Sustainable Forest License (SFL) for the NHF. Finally, the audit reviewed the performance of the Ontario Ministry of Natural Resources (OMNR) in meeting its obligations on the NHF.

During October 2007, Abitibi-Consolidated Company of Canada (Abitibi) merged with Bowater Inc. and formed a new company called AbitibiBowater Inc. Under the terms and conditions of this merger, all licences and contracts associated with the NHF remain under the name of Abitibi-Consolidated Company of Canada. Any reference to Abitibi or AbitibiBowater is considered to be the same entity as the holder of SFL #550587.

An independent team of auditors conducted the audit. The audit team consisted of three registered professional foresters, a biologist/ecologist, and a socio-economist. Each member of the team was assigned specific duties and responsibilities. A list of the audit team members and their qualifications is presented in Appendix B.

The audit was conducted under the guidance of the *Independent Forest Audit Process and Protocol* (OMNR 2008). This protocol outlines eight principles upon which the audit is based (see Appendix C). The principles define the major features of forest management that were audited. Each principle is supported by a series of criteria.

To measure and assess auditee performance, the audit team considered all eight principles collectively. In total, the protocol identifies 97 criteria and 146 individual procedures that were applicable to this forest and assessed as part of the audit. The audit team analyzed the findings from the audit and, where appropriate, noted any failures, non-compliances, or exceptional practices related to individual principles or criteria.

This report summarizes the findings of the audit and presents recommendations and suggestions. Recommendations are made where, in the opinion of the audit team, the auditees have not met a performance requirement or where an observation, or a collection of observations, has led the auditors to conclude that there is an issue of concern. Auditees are required to design, document, and implement specific remedies for the issues raised through recommendations. Suggestions have been made for situations where the audit team anticipates the auditees could elevate their forest management practices above the prescribed standard. Note that recommendations have been separated in the text and summarized in Table 12. Suggestions are contained within the text of the report.

2.1 Audit Process

The auditors collected evidence through document review, interviews with staff and stakeholders, and physical inspection of field activities that occurred on the NHF between April 1, 2003 and March 31, 2008. The audit process began with a site selection meeting in Iroquois Falls on August 7 followed by a pre-audit meeting on August 8. The purpose of the meeting was for the lead auditor, AbitibiBowater, and OMNR to discuss audit logistics and for the lead auditor to collect background information and documents for the audit. Following the meetings, an audit plan was finalized and distributed that outlined the audit schedule and identified the main contacts for the audit.

From August 1 to September 24 the audit team reviewed documents describing forest management activities on the NHF through the audit period. Interviews were held with a variety of interested parties. Personnel from AbitibiBowater and OMNR were interviewed throughout the audit. Most of these interviews took place in person, but contact by phone and e-mail between the audit team, auditees, and the public was common.

A survey was sent to 624 stakeholders on August 26 and 27 using the mailing list that OMNR Timmins District maintains for the NHF. The audit team received 34 responses to the survey by mail and nine by e-mail.

Field site visit locations were selected to evaluate harvest, renewal, tending/maintenance, free-to-grow (FTG) operations, areas of concern (AOC), road construction and maintenance, site preparation, water crossings, wildlife management activities, and other areas of special interest. Sites that had multiple audit values (e.g., renewal and AOC) were preferentially selected. Field sites were also selected to ensure that all geographic areas of the NHF were observed and to ensure that evaluations of winter and summer operations were representative of actual operations and included representative sites for the operations of each of the overlapping licensees. On-site and field audit activities occurred between September 29 and October 3.

The audit team verified records and information systems in the AbitibiBowater and OMNR offices. The team split into two or three field crews at different times, each of which was accompanied by AbitibiBowater or OMNR staff. Representatives of the local citizens' committee (LCC) accompanied an audit team on each field day. Sampling was completed through 13 person days of field inspections, including one day of helicopter time to access winter operations. Sampling continued until the auditors had viewed all of the selected sites and were satisfied that they had viewed enough sites to be confident in their assessment of field performance.

Table 1 shows the total amount of each key activity that has occurred on the NHF during the audit period, total area of the sites visited, and the sample size as a percentage of the total area. The protocol requires the audit team to sample a minimum of 10% of the area treated during the audit period, and to increase the sample where higher risk activities were identified.

Table 1. Sampling intensity of the audit.

Activity	Total Area in Audit Period (ha)	Total Area Sampled (ha)*	Sample intensity %
Depletion	15,865	2,515	16
Artificial Renewal	5,998	1,756	29
Natural Renewal	6,357	1,057	17
Aerial Tending	6,827	1,200	18
Ground Tending	264	243	92
Free to Grow	12,496	2,088	17
Specified Procedures Sites	5,300	1,077	20
Road Access and Maintenance Agreement sites	898 km	395 km	44

* Three sites included in the original audit sample were not visited, including 112 ha of FTG area and 120 ha of harvest area.

Area of concern sampling intensity was determined for 5 classes of common AOCs: Nest Sites 5% (6 of 120); Canoe Routes 5.6% (6 of 106); Water Quality and Fish Habitat 3.4% (34 of 1006); Cultural Heritage 1.8 % (11 of 596); Moose Aquatic 1.1 % (5 of 457). The total number of AOCs included all AOCs listed in the Supplemental Documentation for the 2003 plan, which constitutes the operating area for this audit. Over the course of the field audit, the auditors made formal observations on 69 AOCs, covering a wide range of values. In addition, the audit team travelled extensively on the road system in the NHF and observed operational road conditions on primary and secondary roads.

In total, the auditors visited 30 sites on the ground and 25 sites from the air.

2.2 Forest Management Context

The NHF was created from the amalgamation in 2003 of the Timmins Forest, the Driftwood Forest, and the Timmins Crown Management Unit. The purpose of the amalgamation was to combine three small forests into a moderately-sized forest to maximize the efficiency of forest management planning, implementation, and reporting.

The three former management units comprising the NHF are adjacent to one another and are located in the Cochrane, Timmins, and Kirkland Lake Districts in the Northeast Region of the OMNR. It is planned that in 2010 the NHF will be amalgamated with other forests to become the Cochrane Area Forest.

AbitibiBowater previously administered both the Timmins Forest and the Driftwood Forest as SFL #501800 and #501700, while the Timmins Crown Management Unit was previously administered by the OMNR. Since April 1, 2001, the Timmins Crown Management Unit has been licensed and administered to AbitibiBowater by temporarily adding it to their Iroquois Falls SFL #542531. The Timmins and Driftwood Forests have been operating under forest management plans (FMP) prepared for the 1998-2003 operating periods, while the FMP for the Timmins Crown Management Unit was prepared for the 2001-2006 operating period. All three plans were prepared according to the *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM) (OMNR 1996).

Forest operations have occurred on the NHF since the late 1940s or early 1950s, supplying the pulp and paper mill in Thorold, Ontario, the McChesney sawmill in Timmins, Ontario, and the mining industry. Horses and yarding systems were initially used to skid wood but operations gradually became more mechanized. The harvest operations continued producing conifer sawlogs, pulpwood, and chips from 1950 to the present. Additional sawmills in Cochrane (Tembec Inc.), Timmins (Little John Enterprises Ltd.), and increased use of pulpwood and chips by AbitibiBowater have increased the spruce/pine/fir utilization to the existing supply.

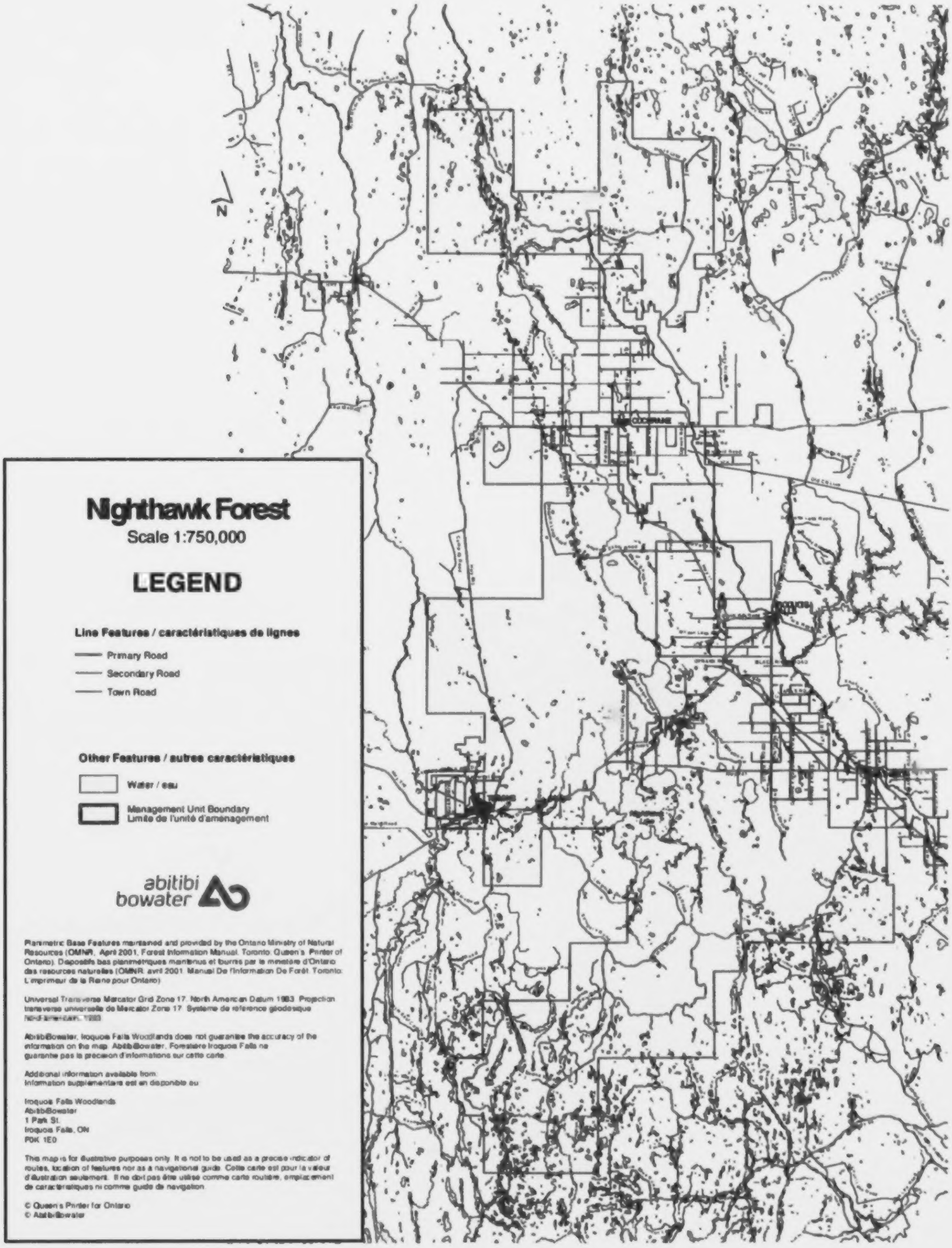
Poplar veneer harvesting began in the 1960s to supply the Norbord Inc. plywood plant in Cochrane, but the poplar resource was largely underutilized. The construction of the Malette Inc. (now Grant Forest Products) waferboard mill in Timmins in the early 1980s, and the expansion of the Grant Forest Products oriented strandboard mill in Englehart in 1988, have steadily increased the poplar utilization to the point where, until recently, it matched the available supply.

During the 1980s and early 1990s, the most productive upland mixed and conifer sites were planted to black spruce, jack pine, and white spruce. With an effective tending program, these stands were maintained or became conifer-dominated. In the 1990s the Company focused more on improving natural regeneration success through careful logging, especially on lowland sites.

The NHF has very little backlog area requiring renewal due to aggressive and successful past renewal programs conducted both by OMNR and AbitibiBowater's corporate predecessor, Donahue Inc.

2.2.1 Map of the Management Unit

A detailed map of the NHF is provided in Figure 1.


N
Nighthawk Forest
Scale 1:750,000
LEGEND
Line Features / caractéristiques de lignes
Primary Road
Secondary Road
Town Road
Other Features / autres caractéristiques
Water / eau
Management Unit Boundary
Limite de l'unité d'amenagement
abitibi bowater

Planimetric Base Features maintained and provided by the Ontario Ministry of Natural Resources (OMNR, April 2001, Forest Information Manual. Toronto: Queen's Printer of Ontario). Dispositifs bas planimétriques maintenus et fournis par le ministère d'Ontario des resources naturelles (OMNR, avril 2001. Manual De l'Information De Forêt. Toronto: L'imprimeur de la Reine pour Ontario).

Universal Transverse Mercator Grid Zone 17. North American Datum 1983. Projection transverse universelle de Mercator Zone 17. Systeme de reference géodesique nord-américain, 1983.

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Additional information available from:
Information supplementaire est en disponible au:

Iroquois Falls Woodlands
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Figure 1. Map of the Nighthawk Forest.

2.2.2 Forest Description

The total landbase of the NHF includes 569,257 ha (5,693 km^2).The NHF contains a total Crown landbase of 437,256 ha (4,373 km^2), including 8,546 ha (85 km^2) in parks. Patent lands represent 131,094 ha (1,311 km^2) and federal lands represent 907 ha (9 km^2). The area figures include: water, non-forested land, non-productive forest, and productive forest. Table 2 presents a summary of the managed Crown land on the NHF for 2003-2008.

Table 2. Landbase summary for managed Crown lands on the Nighthawk Forest (2003-2008).

Land class	Area (ha)
Non-forested	42,078
Forested	
Non-productive	29,738
Protection	12,887
Production forest	
B&S/NSR/Below regeneration standards	8,488
Depleted/Recent Disturbance	34,410
White pine	109
Red pine	6
Jack pine	20,917
Spruce	173,092
Balsam	20,562
Larch	4,148
Cedar	7,726
Yellow birch	42
Poplar	56,169
White birch	18,294
Total production forest	344,007
Total forested land	386,632
Total area	428,710

Source: Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report for the NHF (see Appendix A).

2.2.3 Forest Management Issues

The task of managing any public forest in Ontario is going to bring with it challenges and issues. The auditors reviewed the most recent independent forest audits, the 1998-2003 Report of Past Forest Operations (RPFO), and the 2008 -2028 FMP to identify issues on the NHF. Issues were also identified as part of the public consultation process and LCC members and OMNR staff were polled for input at the pre-audit meeting. The most significant issues, as identified prior to the audit, are as follows:

1. The NHF is located close to Timmins and is subject to a great deal of pressure from public use which impacts forest access development, access management, wildlife, and fisheries.
2. Forest values data have been seen as incomplete and the verification of values data by OMNR has not been timely.
3. High levels of mining exploration work have resulted in forest disturbance and road degradation.
4. Demand for minor and incidental tree species is at a low level.
5. The southern part of the forest contains Great Lakes-St. Lawrence tree species and forest types. More attention needs to be applied to these areas to ensure their continued presence on the SFL.
6. The amalgamation of other forests into the NHF has led to issues from combining information systems and providing historic information.
7. The Ontario forest industry is in retreat due to a variety of issues. This has lead to significant declines in harvest over the audit period. Additionally, discretionary spending has been curtailed throughout the industry. Auditors will be sympathetic to these issues but they will not influence the examination of the NHF.
8. Results from the previous independent forest audit will be considered.
9. Renewal efforts may have declined in recent years.
10. The fire cycle used in the Strategic Forest Management Model (SFMM) is too short.

This will be the first audit on this forest following the amalgamation of the Driftwood Forest, the Timmins Forest, and the Timmins Management Unit. Forest operations have been assessed in two forest audits for each of the predecessor forests and through on-going compliance monitoring. In general, overall forest practices have been found to be acceptable.

3.0 SUMMARY OF AUDIT FINDINGS

3.1 Commitment

Within the audit, commitment is assessed in terms of the existence of policy documents that provide a vision and mission to the forest management organization, while giving long-term guidance to the management of the organization. Commitment must also be evident in the day-to-day operations of the organization.

AbitibiBowater has met the commitment requirements of the independent forest audit by securing and maintaining registration to two independent standards: the International Organization for Standardization (ISO) ISO 14001 and the Canadian Standards Association (CSA) Sustainable Forest Management Standard (CSA Z809). Both standards require a demonstrated commitment to the environment and compliance with applicable laws and regulations and, in the case of the CSA standard, a commitment to nationally recognized criteria of sustainable forest management. The ongoing performance of AbitibiBowater with respect to these standards has been verified annually by independent auditors.

AbitibiBowater has met the requirement to implement a compliance program in a manner that confirms the commitment to uphold all laws and regulations applicable to forest management operations on the NHF. Section 3.6.2 of this report provides a detailed review of the compliance program.

From the discussions the audit team had with staff at all levels within the OMNR, it was apparent that OMNR staff are familiar with corporate policies and guidelines and are committed to carrying out the mandate of the OMNR.

Tangible evidence of the commitment of AbitibiBowater and OMNR beyond the regulated requirements was evident throughout the audit; their knowledge of the local forest was excellent. Relationships with stakeholders were professional and positive.

3.2 Public Consultation and Aboriginal Involvement

3.2.1 Local Citizens' Committee

An effective and involved LCC is a key tool for involving the public in forest management in Ontario. The Timmins LCC is the lead LCC for both the NHF and the Romeo Malette Forest. The Timmins LCC was established in the early 1990s as a standing committee and is comprised of a number of long-standing members.

Small portions of the NHF also occur in OMNR's Cochrane and Kirkland Lake Districts. However, since the Timmins LCC is the lead, they were the focus of the audit. All members of the Timmins LCC were offered the opportunity to provide input to the audit. Two members of the Kirkland Lake LCC (including the Chair) and the Chair of the Cochrane LCC were also asked to provide input. No concerns were expressed by the other LCCs over the level of their involvement in the preparation of the NHF FMP. A total of ten Timmins LCC members provided input to the audit team via personal interviews or returned surveys. Both members of the Kirkland Lake LCC provided input.

Members of the Timmins LCC have been appointed by the District Manager and cover a diverse mix of interests including: trapping, recreation, the environment, independent loggers, mining/mineral exploration, cottaging, hunting and fishing, First Nations, and business. At the time of the audit, the LCC had also recruited two high school students. While there are some LCC members with very specific interests, the majority of members are concerned with the overall sustainability of the forest. This has manifested itself in different ways over the course of the audit.

Members of the LCC have indicated that they would like to see more participation from First Nations representatives. While the participation of First Nations at LCC meetings is not always considered a high priority by First Nation representatives, it does provide an opportunity for LCC members to hear directly the interests and concerns of First Nations.

The Timmins LCC has terms of reference that were revised in April 2008 and are to be reviewed every two years. The terms of reference is for the Timmins LCC as a whole and is not management unit specific. The terms of reference does not comply with the FMPM because the name of each committee member, their affiliation, and date of appointment are not included, and required funding is not identified. It is recommended that the terms of reference be updated to bring it in compliance with the FMPM and, more importantly, identify how the Timmins LCC will be involved in the new Cochrane Area Forest.

A challenge going forward on the new Cochrane Area Forest will involve the Timmins LCC. Most of the NHF (except for the former Driftwood portion) is known to Timmins LCC members and there is the potential for their input to get lost in the new proposed forest management unit. Both OMNR Cochrane and Timmins Districts will need to work together to ensure they are meaningfully involved.

Recommendation # 1: The terms of reference for the Timmins LCC shall be updated to reflect FMPM requirements and to describe how the Timmins LCC will be involved in the new Cochrane Area Forest.

The Timmins LCC appears to be quite effective and the LCC members generally are pleased with their participation. The LCC was very complimentary about the training and educational opportunities that OMNR and AbitibiBowater have provided. It appeared that all of the matters (e.g., plan amendments, annual work schedule (AWS) review) that require LCC input are put forward to the LCC for their review.

The audit team notes that at the end of each meeting each LCC member was asked what they liked or if they had concerns arising from the meeting. This was a good practice and one that the auditors had not observed elsewhere in the province.

The LCC representative on the Planning Team was highly involved and participated in most meetings. The same individual participated on all three days of the field audit and attended the opening and closing audit meetings.

This is a highly involved LCC and a number of its members do not have a problem challenging the OMNR or AbitibiBowater about issues.

An LCC Report on Participation in the 2008 FMP was prepared. The report met the requirements of the FMPM except for the absence of "an assessment of the effectiveness of the committee(s) structure and any recommendations for change". Most of the LCC members are of the opinion that the LCC is effective and that both AbitibiBowater and OMNR seriously consider the input of the committee. That being said, a concern was raised that issues raised at LCC meetings are not always followed up. In the review of the LCC minutes and correspondence it was noted that the LCC had initiated the development of a tool to track all action Items it has raised over time and monitor whether the issues have been addressed. The audit team noted that this is potentially a very useful tool for a volunteer committee where different members raise issues but do not have the time to constantly track them. Such a tool is particularly beneficial in this case because OMNR Timmins District has experienced a significant degree of turnover in staff and the lack of consistency may have contributed to this problem. It is suggested that the Timmins LCC and OMNR continue to follow this tracking process.

3.2.2 Forest Management Plan Standard Public Consultation Process

The 2008-2028 FMP was prepared according to the FMPM with the required consultation opportunities provided as outlined in the manual. A review of public comments made during the FMP preparation confirmed there were no concerns expressed about the consultation process within the period of the audit.

One concern was raised by a member of the public about the lack of consultation associated with a harvest that occurred on the Watabeag Lake Road. While the complaint occurred in 2008, outside the audit period, the harvest itself was completed within the audit term. The harvested block was not part of the original FMP allocation, but was added through an amendment to the FMP. The amendment notification met the technical requirements of the FMPM, but notification was not circulated to an area that included cottages that are accessed from the Watabeag Road but are not in the immediate catchment area. It was confirmed by OMNR that the consultation requirements were met, but the effort was not adequate to ensure that the affected public was aware of the amendment. As a result of this incident, the OMNR has adjusted their consultation requirements to avoid a similar problem in the future.

3.2.3 Issue Resolution

A review of the notices and issue resolution letters confirmed that opportunities were provided to invoke the issue resolution processes.

The audit team notes that the 2008 FMP was not approved by the OMNR Regional Director until April 2008, and the formal elevations of requests for individual environmental assessments did not occur until after that date. As such, they are outside the audit period. However, it is useful to review the issue resolution process that was used and include information that was current at the time the audit report was being prepared.

During the preparation of the 2008 FMP, two separate public concerns were elevated through the issue resolution request process. The first involved a concern around a proposed haul route on the Grindstone Road. The second involved a concern around the appropriate fire return interval used in the preparation of the FMP and consequent concerns about the protection of biodiversity.

The Grindstone Road issue involved the complaint by individuals concerned about the nuisance effects (e.g., noise, dust, vibration) associated with the log hauling operation using this municipal road. The issue resolution process was formally invoked in May 2007 following the unsuccessful resolution of the issue during Stage 2 of the FMP process. The District Manager issue resolution meeting occurred and a decision was made in July 2007. The decision supported the planning team's decision of selecting the Grindstone Road as the haul route and identified additional mitigating measures that would potentially lessen the effects of the proposed haul. In August of 2007 the individuals requested that the issue be elevated to the Regional Director stage. A meeting on the issue occurred in November 2007 and the Regional Director issued his decision in February 2008, upholding the position of the District Manager along with the addition of a few mitigating measures.

In the view of the audit team, the issue resolution process was discharged properly by the OMNR and supported by AbitibiBowater. Both the OMNR and the Company made extensive efforts to resolve the issue, even though the FMP process was questionably being used for a complaint about the use of a road that is under municipal jurisdiction.

The second issue resolution process involved the length of the fire cycle used in forest planning. The proponent argued that the FMP used a fire cycle that was too short, thereby driving the calculations used within the SFMM to support a higher harvest level. The effect of the higher harvest level will lead to insufficient conservation of biodiversity and degradation of wildlife habitat over the long term.

This concern appeared during the review of the proposed Long-Term Management Direction. Attempts to resolve the issue with the planning team were unsuccessful and a request was made to elevate the issue resolution process to the District Manager in August 2007. Following the District Manager's decision to support the position of the planning team, the issue was elevated to the Regional Director. When the Regional Director issued his decision supporting the fire cycle identified by the planning team, the party was notified that there was an opportunity to request an individual environmental assessment through the Director of Environmental Assessment and Approvals Branch.

The issue resolution approach followed by the OMNR was consistent with the requirements in the FMPM.

3.2.4 Individual Environmental Assessments

A review of the notices and issue resolution letters confirmed that opportunities were provided for requests for individual environmental assessments. As the 2008 FMP was not approved by the Regional Director until April 2008, the formal elevations of requests for individual environmental assessment did not occur until after that date and, as such, are outside the audit period. However, the audit team is aware that the Ministry of the Environment has made a decision not to elevate the request concerning the issue of fire cycles to an individual environmental assessment but, in doing so, has imposed four conditions on the 2008 Nighthawk FMP, as follows:

1. "The MNR shall ensure the harvest on the Nighthawk Forest equate to no more than 20 percent of the 10 year allowable harvest area (AHA) by forest unit balanced over the first two years of the Nighthawk Forest 2008-2018 Forest Management Plan;

2. If approval of the Cochrane Area Forest 2010-2020 Forest Management Plan is delayed, MNR shall ensure further harvest on the Nighthawk Forest will not exceed 10 percent of the 10 year AHA by forest unit in each subsequent Annual Work Schedule (AWS);

3. The MNR shall offer to meet with the requester who raised concerns with the fire cycles used for the Nighthawk Forest 2008-2018 FMP. These discussions are to offer an opportunity for the requester to review and discuss the fire cycle calculations for the Nighthawk Portion of the Cochrane Area Forest 2010-2020 Forest Management Plan, and how the sources cited by the requester in the individual Environmental Assessment request for the Nighthawk Forest 2008-2018 FMP were considered as part of these calculations.

4. The MNR shall submit a written statement to the Director of the Environmental Assessment and Approvals Branch, Ministry of the Environment, at the end of each AWS, and within 30 days of the conditions

> having been fulfilled, indicating when and how conditions 1 through 3 have been fulfilled. "

In the view of the audit team, the conditions provide a suitable placeholder that will require the authors of the 2010-2020 FMP for the Cochrane Area Forest to review the scientific information relating to the length and ecological effects of the fire cycles of this forest.

3.2.5 Aboriginal Involvement in Forest Management Planning

Four First Nations - Wahgoshig, Matachewan, Mattagami and Taykwa Tagamou - have a clearly defined interest in the NHF and participated extensively in the preparation of the 2008 FMP. A fifth First Nation, the Moose Cree, had identified an interest in a minor portion of the most northerly section of the NHF and did not need to participate in consultation activities during the period of the audit. The Moose Cree have requested and received correspondence and planning information on the 2008 FMP.

Each of the Wahgoshig, Matachewan, Mattagami, and Taykwa Tagamou First Nations participated on the planning team. These First Nations also formed the First Nations Task Team to address matters specific to aboriginal concerns relating to the production, development, and implementation of the NHF FMP. The First Nations Task Team appeared to be very effective.

These four First Nations participated in both the general consultation approach outlined in the FMPM and the separate aboriginal consultation with information tailored specifically to each community throughout the planning process. Mattagami, Wahgoshig, and Taykwa Tagamou First Nations elected to have information centres in their communities. Overall, the approach and operations of aboriginal involvement in the preparation of the 2008 FMP for the NHF were consistent with the FMPM.

The First Nations Task Team spent a significant amount of effort on the development of appropriate AOC prescriptions for native values, examining maps of proposed operations and addressing concerns about the impact of possible operations on these values. In some cases, this involved field visits with a licensed archaeologist to areas of particular interest and concern. It appeared that all concerns were addressed. Values that required extra work included moose aquatic areas, traplines, and cultural heritage.

All of the First Nation representatives are in agreement that First Nation value prescriptions should be negotiated case by case with the affected community and should consider the significance of the value as well as landbase opportunities and constraints. The First Nation representatives felt some pressure to go with standard AOC reserve widths that were used in the 2003 FMP. Ultimately, there were no outstanding concerns with respect to the protection of the values. The approach of the First Nations representatives in negotiating protection measures was useful and effective.

During the preparation of the 2008 FMP, a significant amount of effort was spent working with Matachewan First Nation on a solution to harvesting in what is known as Block 139 in the southern area of the NHF. While the resolution of this issue took close to two years, Matachewan indicated that they were satisfied with the final solution which allowed for some harvesting.

In the preparation of the 2008 Nighthawk FMP, First Nation representatives had significant concerns with the OMNR's High Potential Cultural Model (now also referred to as the Heritage Assessment Tool or HAT). The concerns of the First Nation representatives were identified in the FMP as:

> "The First Nation representatives of the planning team acknowledge the need for the use of the High Potential Cultural Heritage Model in the FMP process. However, in the case of the Nighthawk Forest, the HPCH Model appears to fall short in protecting First Nation values. Values that had been shown in the 2003 FMP process were dropped in the 2008 output, and numerous areas are known to be of significance to the First Nation communities."

At the root of the concern is a misunderstanding of what the model can and cannot do. The OMNR's HAT Model identifies areas that might contain archaeological sites based on the presence of specific landscape features (e.g., slopes, proximity to water) that resemble the location and site conditions of known sites on the forest management unit. The HAT is not a replacement for the identification and protection of known aboriginal values, particularly if these sites do not occur in locations that cannot be predicted by the model. While it is likely that some aboriginal values do overlap with areas of high potential identified during the modeling (e.g., campsites on water bodies), many values could not be identified by the logic inherent in the tool.

The identification and protection of aboriginal values by First Nations is a critical but separate exercise from HAT modeling in forest management planning. Used in tandem, the aboriginal values collection process and the HAT modeling are valuable tools in the protection of cultural heritage on the landbase. It is suggested that, in preparation for the next Cochrane Area FMP, a presentation be given on the model and its logical constraints.

All of the First Nations with an interest in the NHF have other forests of higher interest to them, both in terms of values and economic opportunities. The economic interests of the First Nations are different and have varied over the course of the audit period. Mattagami First Nation has had a logging company and traditionally harvested for both Domtar and Tembec on forest management units to the west of the NHF and closer to their reserve (Spanish, Pineland, and Romeo Malette Forests). Matachewan First Nation, whose primary focus is the Timiskaming Forest, has individual members who have been involved in the logging business. They also work on silvicultural contracts and have been, and still want to be, provided with the opportunity to do this work on the southern part of the NHF.

Taykwa Tagamou and Wahgoshig First Nations have had a Working Partnership Agreement with AbitibiBowater and the OMNR since 2000. This agreement has provided for harvest opportunities, other economic opportunities, and training. Representatives from Taykwa Tagamou and Wahgoshig First Nations spoke highly of the agreement and working with AbitibiBowater. The agreement is intended to cover the geographically overlapping areas between the traditional territories of the First Nations and AbitibiBowater's licences. While most of the harvesting work occurs on the Iroquois Falls Forest, Taykwa Tagamou First Nation has harvested occasionally on the NHF.

As the NHF is not the main forest of interest for any of these First Nations, and with the potential amalgamation of the Cochrane Area Forest, it may be a challenge to find the right level of consultation for First Nations, such as Matachewan and Mattagami, whose geographic interests cover only a small portion of the new Cochrane Area Forest.

3.2.6 Annual Operations Public Inspection and/or Consultation

The audit team inspected the public notices that pertain to the annual operations. The notices met the requirements of the FMP. No complaints from the public were identified about lack of sufficient consultation on annual operations.

3.3 Forest Management Planning

The development of the 2008 FMP for the NHF was a seminal event for both AbitibiBowater and the OMNR as it was the first time the 2004 FMPM (OMNR 2004) was applied in the Northeast Region. The challenge of interpreting the new FMPM and then applying those interpretations within Ontario's prescribe planning schedule was evident. In the end a 500+ page plan was produced along with more than 800 pages of supplementary documentation and a 300 page analysis package. The plan was approved (late) and is currently being implemented. All members of the planning team should be congratulated on their efforts.

3.3.1 Plan Author, Planning Team, Chair, and Advisor Activities

The planning team for the 2008 NHF was formally constituted on June 5, 2006 with the Regional Director's approval of the terms of reference. All components of the terms of reference were present. The planning team had fifteen members including five foresters, one biologist, one LCC member, and four members from First Nations. The plan author is a Registered Professional Forester (RPF) licensed in Ontario.

During the development of the plan there were 29 planning team meetings. Planning team minutes recorded the hundreds of tasks undertaken and completed. Issues were discussed and resolved where possible. The planning team employed a number of task teams to undertake specific tasks. Task teams were highly effective in addressing specific planning requirements.

The new FMPM introduced six progress checkpoints for the development of long-term management direction. Planning team members and plan advisors are to "confirm satisfactory completion" of the checkpoints. The OMNR "acknowledged" that checkpoints had been met, but failed to confirm satisfactory completion. This lacks the support and endorsement that such checkpoints were meant to solicit. Planning checkpoints were not generally met on time but were completed within six or seven months of the planned date. Many of the delays centered around OMNR not "acknowledging" the checkpoint when information (both draft and revised) was received. Four of the checkpoints were acknowledged within one week in June 2007, while the two initial checkpoints were acknowledged in December 2006. It appears that an excellent concept has not been optimally implemented. There is additional discussion of this in Section 3.3.4 of this report.

Recommendation # 2: The OMNR Northeast Region and District shall confirm satisfactory completion of progress checkpoints in sequence and in a timely manner.

3.3.2 Introduction

The introduction to the 2008 FMP includes a discussion of the purpose of the plan and the context in which the plan was developed. The plan introduction includes how OMNR's Statement of Environmental Values was considered in the development of the plan. The Statement of Environmental Values (found in Supplementary Documentation 21) for the plan was approved by the Regional Director on March 5, 2008 and contained all the required contents. The required index of environmental assessment requirements was provided in Figure 5 of the FMP.

3.3.3 Management Unit Direction

The 2008 FMP contains a detailed description of the NHF. This section of the plan describes the administration of the forest, the communities in and around the forest, and the wood supply commitments on the forest.

The description of the geology, soils, and eco-sites can be found in the 2008 FMP. The implications of these aspects were discussed as they pertain to forest management. The biggest limitation was found to be the lowlands in the north rather than the uplands in the south.

The historic forest condition is presented on pages 16-27 of the 2008 FMP. This section describes the history of the area and the three former forests it contains. There is a detailed description of the fire history, which has had a great influence on the forest. Major fires from the past 20 years are discussed in some detail. Major spruce budworm and forest tent caterpillar infestations are described and mapped. Comparisons and differences between the current and presettlement forests are described. Throughout the forest description, and the 2008 FMP in total, there are a series of excellent maps which illustrate a variety of values and their distribution across the NHF. AbitibiBowater is commended for the high quality of the maps provided.

Forest resource inventory (FRI) information is key to good planning. Revisions to the FRI are crucial to the success of a management plan. The planning inventory was approved on December 6, 2006. The review period from February to October 2006 had resulted in a large number of adjustments to the inventory. This reflects the exacting detail that the OMNR was seeking to find within the FRI. The inventory update included depletions and accruals, ownership updates (important on the NHF as there is a considerable amount of patent land), and updates required by the Forest Information Manual (OMNR 2001b). Forest Resource Inventory base features data was provided to the planning team on time, but the patent land layer was over one year late and contributed to the delay in approval of the 2008 FMP.

All Ontario Living Legacy lands were removed from the production forest landbase. These areas are carefully described in the FMP.

The 2008 FMP describes the area of managed Crown forest available for timber production, landscape patterns, habitat for selected wildlife species, landscape processes, fish and wildlife resources, existing roads, and land uses. It includes a large number of tables and maps.

The 2008 FMP also describes the old growth forest; vulnerable, threatened, and endangered species; wetlands; and recreation resources. The implications of forest management within these areas are discussed, as are the influences they have on forest management. Social and economic descriptions are presented in the FMP. The value of these contributions to the plan is tangential and of minor use to the planning process. The forest industry contributes to all local communities when it operates.

3.3.4 Strategic/Longterm Management Direction

Section 3 of the 2008 FMP for the NHF presents a brief description of the longterm management direction of the forest. A more expansive description of the longterm direction can be found in the supplementary documentation (Section 22). The Analysis Package also contains a detailed discussion of the longterm direction. This part of the 2008 FMP is an important contributor to the longterm success of management of the NHF as it describes where management will take the forest and the types of benefits which will be provided.

An important first step in determining management direction is deciding how to organize the forest for management. Initially the planning team developed the 15 forest units (i.e., organization of similar stands) which would become the basis for forest modeling, developing silvicultural ground rules, and allocating stands for operations. At this stage the planning team also verified the habitat classifications and wildlife species which would be forecast. The checkpoint for forest units and wildlife habitat was set by May 2006. The actual acknowledgement date for these checkpoints was December 6, 2006.

Once primary organization of the forest has been met, the SFMM can be implemented. An initial model formulation is called the "base model" for the FMP. The development of the base model is a key checkpoint in the planning process as it leads into the analysis of management direction. In September of 2006 an initial base model was submitted with a revised model being submitted early in November 2006. Acknowledgement of this checkpoint was not provided until June 1, 2007. Checkpoint achievement was documented by AbitibiBowater and acknowledged by OMNR. All the major assumptions have been documented in the Analysis Package. In the absence of OMNR acceptance, the planning team proceeded to undertake the analysis of management direction.

The content of the base model met the requirements of the FMPM and OMNR. The inputs into the model, including, yield curves, fire cycle, operability, succession, planned (e.g., roads and landings) and unplanned loses (e.g., losses due to insect, disease, fire or wind), expected silvicultural effort and revenues were reviewed by the auditors and were found to be reasonable.

Scoping analysis was undertaken to look at the range of possibilities that the NHF can provide. The scoping analysis checkpoint was acknowledged by OMNR on June 1, 2007. The scoping analysis involved examining 92 modeled alternatives (scoping runs), including those prescribed by the Forest Resource Assessment Policy. The scoping runs altered variables such as old growth, marten core areas, natural disturbances, poplar mortality, harvest flow, and timber value. Many of the modeled alternatives were academic and unrelated to the decisions made within the FMP. The number of the alternatives examined and the volume of information that supports each alternative is overwhelming. Given the coarseness of the data that constitutes the basic biological inventory supporting each SFMM run, it is hard to imagine that each of the 92 alternatives provided statistically distinct management possibilities. It is suggested that future plans might add efficiency to the process by limiting SFMM runs to those likely to provide a statistically significant outcome alternative.

The Support for Proposed Management Strategy checkpoint was acknowledged on June 1, 2007. The long-term management direction was developed in the fall of 2006, presented to the LCC on November 29, 2006, and to the Regional Director on January 15, 2007. Public review occurred from March 12 to April 11. Based upon public input and alterations provided by OMNR, the planning team revised and resubmitted the Proposed Management Strategy in May of 2007. The analysis was massive and reported on all major variables for all runs. Analysis contrasted results to plan objectives and each other.

The result of all the modeling and analysis were refined into the Longterm Management Direction to include the verification run, and re-submitted on March 5, 2007. A revised document was presented on May 24, 2007 which addressed issues identified by the OMNR. A 'Preliminary Endorsement of the Long Term Management Direction' was acknowledged by OMNR on June 7, 2007.

3.3.5 Operational Planning/Planning of Proposed Operations

The proposed operations map, like all maps in the 2008 FMP for the NHF, was well done. It was clear, readable, and all required elements were present.

Clear rationale was provided for the selected areas of operations. The selected areas were chosen to follow the Available Harvest Area (AHA) as closely as possible in terms of forest unit age classes. There were minor substitutions of older or younger stands. Figure 147 provides a comparison of planned harvest areas. It shows the planned harvest areas by forest unit (Table FMP-15) followed the proposed management strategy very closely. Comparisons of the volumes, harvest areas, and habitat, when modeled for forecast and allocated harvest areas, show little difference over the modeling horizon.

The 2008 FMP has 49 Silvicultural Ground Rules (SGR), a significant reduction from the previous plan and an improvement in the planning process and plan presentation. All required components of the SGRs were present and each was described in detail as were the silvicultural strategies for each forest unit.

Seven silvicultural exceptions were approved as part of the 2008 FMP. These exceptions were proposed and approved to allow renewal treatments that are not recommended in the silvicultural guides. This is a developmental practice, which should help to improve the knowledge of silviculture. Successful treatments will ultimately be incorporated in future silvicultural guides.

The planned harvest allocation is extremely close to that proposed by the selected management alternative, with an overall difference of less than one-tenth of one percent. Stands were allocated based upon a defined set of criteria. Tables FMP-16, -17, and -18 present the harvest allocations to different levels of detail. Table FMP-16 presents the clearcuts proposed in the management plan. One hundred and thirteen clearcuts were planned with 22 exceeding 260 ha in size. Rationale is provided for each clearcut. The number and extent of clear cuts is appropriate for a boreal forest. Table FMP-19 presents the volume allocations to commitment holders for timber from the NHF.

The 2008 FMP presents a strategy for harvesting the areas of poplar decline. Salvage proposals will be included with the AWS for approval as salvage harvesting at a reduced stumpage rate. The 2008 FMP aggressively allocates poplar decline in an effort to rehabilitate areas as quickly as possible.

Section 4.4 of the 2008 FMP describes the silviculture plan, which is being implemented as part of this management plan. The proposed program is consistent with the longterm direction of the NHF. Table 21 presents the detailed silvicultural program. The area to be planted is 4,131 ha, while natural regeneration will occur on 9,968 ha. Tending will be carried out on 6,279 ha with an additional 2,251 ha of poplar decline area to be treated.

Company staff worked with the OMNR districts to plan access in the NHF. Planning for primary and branch roads was undertaken as per the requirements of the new FMPM. Eighty-two km of primary and 17 km of branch roads are planned. Rationale for the location of each road is available in supplementary documents. The auditors confirmed that all of the required planning elements were present. Monitoring procedures were described for each road.

Renewal trust funding is projected to be close to $10 million, which is exactly coincident with the projection of $10 million in silvicultural expenditures. More than half of the projected silvicultural expenditures are for artificial regeneration.

Section 4.7 of the 2008 FMP presents plans for monitoring operations, exceptions, regeneration, and water crossings. The planned monitoring program met the requirements of the FMPM.

Operational planning for the protection of values using AOC prescriptions occupied a considerable amount of time during FMP preparation. The detailed FMP documentation includes the consideration of alternatives, and these are described in the supplemental documentation.

During the public and OMNR review of the 2008 plan there were issues identified related to the fire cycle, changes from the 2003 AOC prescriptions to the 2008 prescriptions, the availability of wildlife survey information, and First Nation AOCs.

Overall, the planning team addressed these issues effectively, and the specific AOC planning and documentation met the requirements of the planning manuals.

During planning there was much discussion of the fire cycle and the importance that has on the habitat supply for two species (Boreal Chickadee and Bay Breasted Warbler). This was not resolved and resulted in a request that the Ministry of the Environment consider a "bump up" to an individual environmental assessment under the Environmental Assessment Act. Neither the discussion during planning nor the subsequent involvement and decision of the Ministry of the Environment resulted in any specific AOC changes (see also Section 3.2.3).

The auditors reviewed the process for the updating of AOC prescriptions from the 2003 FMP to the 2008 FMP, with a particular focus on nest sites. The 2008 FMP had six different levels of prescriptions depending on the nest. This was in addition to separate prescriptions for eagles, osprey, herons, and black terns. Some concern was raised that there were fewer restrictions in the new 2008 FMP. The procedure for assigning the prescriptions followed the direction of the FMPM, and involved the expert opinion of the biologist, with regional support. Regional review showed that the prescriptions were consistent with current scientific knowledge. Given that nests are identified with the assistance of the OMNR biologist, it appears that there is an appropriate safeguard in place.

The planning team addressed new developments appropriately, following the procedures of the new FMPM. For example, during the preparation of the individual AOC prescriptions for cultural heritage values, contact was made with all First Nation community liaisons regarding the First Nation AOC prescriptions for the NHF. All community representatives were in agreement with this information, keeping in mind that First Nation value prescriptions would be negotiated on a case by case basis (see Section 3.2.5). No issues arose from this modified approach.

Preparation of prescriptions requires accurate FRI information for non-timber values. Past independent forest audits have noted some discrepancies and have directed OMNR to address these and update the Natural Resources Values Information System (NRVIS) accordingly. The independent forest audits have recommended:

- available survey resources are used in an effective and timely manner
- field survey data (e.g., nest sites, moose aquatic feeding areas) are uniformly recorded by those collecting the information
- [units are] surveyed for moose aquatic feeding activity/potential in areas proposed for forest management activity

It is noted that these recommendations did not apply to all of the amalgamated SFL area, or to all three of the OMNR districts. The SFL amalgamation appears to have provided an opportunity to synchronize survey efforts and this was done for the 2008 FMP. Development of training and NRVIS procedures, including a data capture form, has improved the consistency of the values recording process. The issues previously identified when operations were conducted across three units seem to have been rectified.

3.3.6 FMP Submission, OMNR Plan Review, and Approval

The 2008 FMP of the NHF was subject of two final Lists of Required Alterations. The initial list contained more than 500 changes and was provided to AbitibiBowater in November, 2007. In January, 2008 a second final list was presented with over 200 additional required alterations. This second submission is counter to planning procedures that allows for one preliminary list and one final list. Many of the required alterations for the second list did not appear to be significant. It is suggested here that lists of required alterations be principally focussed on items that might have a practical influence on the sustainable application of the FMP. At a bare minimum, it is recommended that there be one submission of a final list, as per regulated procedure.

Recommendation # 3: The OMNR Region and District should abide by the review process and provide only one final list of required alterations.

The FMP was certified on April 10, 2008 by an RPF. Approval was granted by the Regional Director on April 21, 2008, approximately five months later than anticipated. Delays in getting the FRI information and delays in acknowledging planning checkpoints were seen to be the most significant factors delaying the approval and implementation of the 2008 FMP.

A plan contributor's page is found next to the signature page and includes five main contributors.

3.3.7 Contingency Plans

There were no contingency plans required on the NHF.

3.3.8 Forest Management Plan or Contingency Plan Amendments

There were 29 plan amendments to the 2003 FMP. Three were for salvage operations, one was for a "water quality concern", and two were for road reclassification. There were ten amendments for allocation changes following the discovery of new values. One minor amendment was processed to add new harvest areas due to an unknown First Nation value. Amendments contain all the necessary information and were properly authorized. Amendments were reasonable, as were their supporting rationale.

There were no situations which required development of a new AOC or values prescription during the implementation of the FMP, although it is noted that nest AOCs were dramatically revised during the 2008 plan. The Company appropriately updated amendments to the osprey AOC after the revision to the guide.

There were 68 AWS revisions to the 2003 FMP. All were sealed by an RPF.

3.3.9 Annual Work Schedules

Annual Work Schedules were reviewed for each year of the audit period. Each AWS was submitted and approved for implementation the following April. The reports contained all of the elements consistent with the requirements of the FMPMs applicable at the time and were consistent with the 2003 FMP. The Forest Operations Prescriptions included with the AWSs were prepared in accordance with the FMPM and were consistent with the SGRs. It was also found that the AWSs were consistent with direction in the FMPMs.

3.4 Plan Assessment and Implementation

3.4.1 Plan Assessment

The audit team assessed the appropriateness of the 2003 FMP in describing the field conditions of the NHF and whether implementation of the 2003 FMP was consistent with direction provided in the plan.

Overall, the auditors found that the FMP described the landbase conditions accurately. AbitibiBowater did a commendable job, particularly since this was the first FMP written for this amalgamated forest. AbitibiBowater appropriately acknowledged the ecological differences between the former Driftwood Forest, designated as the NE2 subunit and comprising approximately 40% of the NHF, and the balance of the NHF, designated as the NE4 subunit. The NE2 subunit, situated to the north around the community of Cochrane, is characterized by level topography with large expanses of lowland flats underlain with widespread surface deposits of water-worked tills and lacustrine soil materials (silts and clays). The NE4 subunit, located around and to the south of the City of Timmins, contains a higher degree of ecological diversity, with greater topographical relief and a variety of glacially-induced landforms and soil types. Glacio-fluvial esker complexes and outwash plains, ground moraines, and glacio-lacustrine plains composed of sands, clays and silts are evident. Rock outcrops and deep organic soils are scattered throughout this subunit area. The planning team applied management assumptions and strategic direction that reflected the differences between the subunits. For example, separate targets were established for wildlife habitat, age class, forest diversity, and forest unit area.

Targets related to social, economic, and silvicultural objectives, which span ecological subunits, were applied on a management unit-wide basis.

Updating the FRI for the NHF in preparation for the 2003-08 FMP was a complex undertaking, involving the amalgamation of three forest management units with dissimilar FRI vintages. The original FRI data is based on aerial photographs sourced in 1991 for the former Driftwood Forest, in 1994 for the former Timmins Forest, and in 1986 for the former Timmins Management Unit. In preparing the amalgamated FRI, AbitibiBowater used the updated FRI for each of the former management units. They also included height data for secondary tree species (species comprising more than 20% of the stand) as well as the average Forest Ecosystem Classification site type for each productive forest stand.

Overall, the auditor's comparison of the FRI to the field conditions did not reveal any large discrepancies. One exception was a stand which had been selected for harvest and was found to have been blown down and was regenerating. On two other sites, portions of harvest blocks remained unharvested due to poor quality timber or low volumes.

Interviews with staff indicated that potential harvest areas are flown prior to final selection for FMP harvest allocation, but are not ground-truthed. It is suggested that AbitibiBowater should consider conducting some form of pre-harvest cruising. Field data collection of this nature would improve the accuracy of the inventory and also assist in confirming the stand volume estimates that are projected by its yield curves, thereby improving its forecasting database as well.

Values mapping was found to be generally accurate. AbitibiBowater has a procedure in place under its Forest Environmental Management System for recording and notifying OMNR when previously unknown values are encountered during operations. The auditors did witness examples where previously unknown nest locations had been located, reported to OMNR, and protected as per the Forest Environmental Management System protocol. There were two occasions where the auditors encountered difficulty in locating bird nests values. In one case, it was determined that the nest had likely blown down. In the other case, the values maps indicated that seven nesting sites involving various species (osprey, great blue heron, and possible raptor) closely grouped could not be found. The OMNR may want to investigate further in any future values surveys.

The areas considered eligible and selected for various treatments, including harvesting, renewal, tending, and maintenance, conformed to the eligibility and selection criteria that were established in the 2003 FMP. Any changes in operations were addressed by amendments or revisions to the appropriate planning documents.

Application of the SGRs was found to be appropriate for the stand conditions that were encountered in the field. The type of treatments being applied were reflected in the SGRs, with only a couple of circumstances noted where refinements in the application may have been warranted. These circumstances are described later in Section 3.6.3.

The audit team was generally satisfied that field operations were consistent with forest management modeling assumptions used in the 2003 FMP, in terms of base model inputs. The nature and types of operations conducted were consistent with the types of operations utilized for modeling purposes. For example, the model assumed that a variety of silviculture and harvest intensities would be applied, which was observed to be the case. The level of activity for most operations did not reach FMP targets, although most target deficits were reasonably explained by a slowdown in the general economy through the audit period.

3.4.2 Areas of Concern

Normally, an AOC is protected through a prescription outlined in specific management guidelines appropriate to the value. The audit team reviewed the implementation of each of the various types of AOCs through direct observation in the field and by examining the Forest Operation Inspection Reports for the selected blocks.

In total, the audit team directly examined 62 AOC prescriptions in the field. The auditors also noted protection of other non-timber values. The team observed 19 water quality fish habitat prescriptions, 11 cultural heritage sites, 11 water crossings (or removals), 6 nest sites, 6 portage or canoe routes, 2 spray buffers, and 5 moose aquatic feedings areas. Of these, 38 were observed during extensive field sampling and 24 were viewed from a helicopter.

The auditors reviewed the appropriateness and the implementation of the AOC prescriptions and discussed the challenges of implementation with the OMNR and AbitibiBowater staff. In most cases, an appropriate prescription has been provided and these are being effectively implemented. Some exceptions are noted below.

AbitibiBowater has a strong commitment to the use of their ISO Environmental Management System. Use of the system is well regulated and includes preparation for start up well in advance of operations commencing on new blocks. A check list is provided to operators, and this is reviewed for compliance by the AbitibiBowater staff.

The auditors noted that, in addition to requirements defined in specific AOC prescriptions, operators used care around values such as marten trap sets and mining claim posts, which are common and very important in this area.

The recommendation has been made in previous independent forest audits that OMNR "...Technicians and Biologists will develop strategies to minimize water quality and fish habitat deterioration due to recreational use once water crossing structures have been removed...". There is an evident environmental impact from the rebuilding of crossings in a very careless fashion by people wanting to access abandoned road networks. Numerous locations where All Terrain Vehicle (ATV) users had crossed steams were observed by the audit team. There does not appear to be any laws being violated, and even if there were, it is clear that enforcement would be challenging. This problem is occurring widely across Ontario. The OMNR is aware of the problem and is taking some limited action, for example, by prescribing "fords" when warranted. As well, the OMNR has examined the implications for both safety and the environment and have clarified their legal liability. The audit team did not identify any specific action that could be taken within the scope of the independent forest audit process to address this problem. It is simply noted as an issue that has the potential to grow in significance.

The audit team noted five occurrences of poor conditions at some of the older water crossings on secondary roads. All of these are still in use and were used during the term of the audit.

AbitibiBowater and OMNR have resolved most of the assignments of responsibility for water crossings through the Crossing Inventory and Responsibility List, which addresses the recommendation to that effect in the previous independent forest audit. In most cases, the problem crossings have been assigned to OMNR. It is recommended that OMNR lead a process to review the specific concerns on water crossings on secondary and primary roads, and take action where warranted.

Recommendation # 4: The OMNR District should lead a process to review specific safety and environmental concerns on older water crossings on secondary and primary roads, and take action where warranted.

Site management prescriptions are used to meet the requirements of other values. For example, the audit team viewed three blocks where the layout was adjusted after the initial planning in order to meet the site requirements in the *Forest Management Guide for Natural Disturbance Pattern Emulation* (OMNR 2001a). In some cases, this involved a more than five hectare change in harvest area, which is a significant impact to planned block layouts.

On balance, with a few exceptions, the audit team felt that AOC prescriptions were appropriately implemented and appeared effective.

3.4.3 Harvest

Harvesting operations on a variety of sites and conditions were inspected by the audit team. All timber harvesting on the NHF was implemented by nine overlapping licensees: Norbord Industries Inc., Roy Warne Logging & Sawmill, Grant Forest Products, Domtar, Nighthawk Timber, Cutrite Firewood, Tembec Industries Inc., Timmins Forest Products, and Stéphane Laplante. Mr. Laplante's operation is unique on the NHF as he utilizes a chainsaw to cut the trees and a horse to skid logs. Operations under the control of Tembec Industries Inc. and Domtar account for nearly 62% of the total planned allocated harvest of 14,129 ha. Norbord Industries Inc. and Grant Forest Products were assigned 3,409 ha of planned harvest, or 24% of the total planned harvest allocation. All licensees, except for Nighthawk Timber, employ contractors to harvest their allocations through commuter-based operations. All operations tend to be located within reasonable driving distance from the communities situated within or near the NHF. Harvest operations are typically assigned geographically by subunit amongst the overlapping licensees.

Harvesting equipment consisted of a mix of full-tree feller bunchers and grapple skidders or cut-to-length harvesters and forwarders. Sorting into various products (sawlogs, pulpwood, and veneer) is performed at roadside into piles by mill destination. The selection of harvesting equipment was at times influenced by the Forest Operations Prescription.

According to four of the five Annual Reports that are available for the 2003-2008 audit period, a total of 7,727 ha were harvested on the NHF, which represents 55% of the planned harvest area of 14,076 ha. A harvest of 1,095,931 m^3 of wood from this area represents 75% of the total planned volume. More progress was made harvesting conifer species (719,719 m^3, or 85% of the planned volume) compared to hardwood species (376,212 m^3, or 63% of the planned hardwood volume). These figures do not include 1,267 ha that were harvested for salvage purposes although much of the "salvage" came from regular harvest allocations that later met salvage criteria (e.g., poplar decline areas as targeted in the allocations) and were categorized accordingly in the Annual Reports. The overall shortfalls in harvest reflect a poor market for forest products through the audit period. The disparity by species is indicative of how the economy has changed in different ways for various timber products.

Observations at all harvest locations visited by the audit team confirmed that utilization and harvesting practices were generally good to excellent. While there were some instances of non-compliance found during site visits, they were minor and isolated cases. For example, only a few high stumps were observed in areas harvested during the winter season. Rutting (site damage caused by machinery operating on soft ground conditions) was noted sporadically at scattered locations, but no extensive damage was observed. This minimal damage reflects the common practice of using high-flotation tires on harvesting equipment. Compliance reports indicate conscientious efforts were made by licensees and contractors to minimize site damage by either moving operations to less vulnerable sites or shutting down operations altogether during periods of wet weather.

Lack of markets for species such as larch and cedar continue to pose a challenge and was apparent at some locations where the number of trees left standing was obviously much greater than the minimum residual tree requirement in the FMP. On sites where all tree species were marketable, the audit team was generally satisfied that the residual requirements were met. There were two sites where the auditors were of the opinion that, although the required number of residuals trees was on site, the composition of the residuals did not reflect the original stand composition. The frequency of this observation was insufficient to change the opinion that conformance to the requirements of the FMP was demonstrated.

There was strong evidence in the field that all harvest blocks are being flagged accurately to match the approved boundaries illustrated in the FMP and AWSs. The overlapping licensees utilized global positioning system (GPS) technology to establish the harvesting boundaries, except when in the vicinity of AOCs where greater care is needed to overcome the limitations of the GPS technology. In these sensitive areas, ground measurements were made to ensure that the AOC prescription was met.

The compliance inspection program appears to be effective. Harvest blocks are normally inspected on the ground by certified inspectors and periodically by helicopter. Progress of the harvest is noted in the compliance reports by the compliance inspector. The audit team's site inspections verified that non-compliances detected by the compliance inspectors were reported and dealt with appropriately. With very few exceptions, harvest operations were properly conducted and in compliance with applicable legislation and regulations. More details regarding the compliance monitoring program are discussed under Section 3.6.1 and 3.6.2.

Harvest operations were normally consistent with Forest Operations Prescriptions and were appropriate for the specific site conditions that were encountered. The predominant prescribed harvest system is conventional clearcut, with the option on some specific site types of practicing Careful Logging Around Advanced Regeneration (CLAAG) or Harvesting with Regeneration Protection (HARP), where natural regeneration is desired and there is little balsam fir in the understory.

It was the auditors' viewed that CLAAG was commonly being applied on sites with prolific balsam fir understory content. This is inconsistent with the SGRs and Forest Operations Prescriptions and was identified as an issue in the 2003 Timmins Management Unit independent forest audit. It is recommended that AbitibiBowater review this practice.

Recommendation # 5: AbitibiBowater shall ensure that all harvest practices reflect the prescription as outlined in the silvicultural ground rules.

One of the sites visited consisted of stands with a high component of yellow birch with lesser amounts of maple and white pine. This is more characteristic of the species found in the Great Lakes-St Lawrence Forest Region. The area had been strip-clearcut with narrow strips (10-15m in width) and were subsequently scarified with a root rake. This treatment had been prescribed following discussions with OMNR staff, however, no amended Forest Operations Prescription could be found to confirm the prescription. Although it was too early to evaluate the effectiveness of this treatment, it did appear to be appropriate for the species and site conditions. Salvage harvest operations were undertaken during the audit period to recover timber that had been damaged or killed by fire, blowdown, and forest tent caterpillar. Repeated infestations by the forest tent caterpillar since the mid 1990s have caused significant mortality to 4,186 ha of poplar stands. Timmins Fire #19 burned 2,791 ha in 2005 in the NE4 subunit. Efforts have been made to salvage harvest and regenerate some of the damaged stands. Further discussion regarding regeneration of the poplar salvage harvest areas is discussed under Section 3.4.4.

Harvest sites were virtually spotless, with very little industrial garbage being found. In one block, it was noted on a compliance report that the logging contractor had cleaned up refuse left behind by other forest users.

For those harvest operations where timber is delimbed and topped at roadside, AbitibiBowater normally requires the contractors to pile the resulting slash. These slash piles are usually burned if they are accessible by all-weather roads and the loss of productive land to slash is minimal. AbitibiBowater has conducted a very effective program in the areas that are well accessed. In winter harvest areas, however, the access is seasonal and it is difficult to bring machinery in to burn the slash during the frost-free season. Piling the slash somewhat minimizes the loss of productive land but the audit team believes AbitibiBowater should make additional efforts at reducing slash in the winter harvest areas. A significant proportion of the harvest occurs on these types of sites. Possible approaches include redistributing slash into the cutover after roadside delimbing or conducting in-bush delimbing. Other approaches should be explored as well. The auditors encourage AbitibiBowater to further increase its slash management efforts on all harvest sites.

Recommendation # 6: AbitibiBowater should explore opportunities to further reduce roadside slash in its winter harvest areas.

Slash was well distributed throughout the harvest blocks where cut-to-length processors had been deployed, rather than occupying valuable land at the roadside. This harvest technique minimizes the loss of productive land to dense slash piles and promotes natural regeneration by scattering cones-bearing slash over potential seedbeds.

Inspection of the documentation revealed that harvest operations were properly approved in the FMP (or FMP amendment) and applicable AWS.

Second-pass harvest operations were conducted on a very limited scale on the NHF during the term of the 2003 FMP. Overlapping licensees are generally required to harvest all marketable species in their designated harvest blocks and to ensure that wood products are delivered to the appropriate mills as directed in their licence agreements. One overlapping licensee, however, is permitted to harvest a small volume of red and white pine and other conifer for custom sawing products.

3.4.4 Renewal

There were 15,138 ha regenerated during the first four years of the five-year audit term. This achievement represents 88% of the planned renewal program of 17,150 ha. On an annualized basis, AbitibiBowater has exceeded their renewal target. Most of the reported renewal is attributed to natural regeneration, which occurred on 11,113 ha and comprises 73% of the renewal program. This proportion of natural regeneration exceeds the 49% proportion that was envisioned in the 2003 FMP.

Natural regeneration techniques include the protection of advanced growth (by practicing CLAAG or HARP during the harvesting operations), relying on natural seeding, and coppice growth (suckering). Mechanical scarification is used on some sites to reduce brush competition, create seedbeds, or stimulate coppice growth, thereby creating conditions more favourable for natural regeneration.

The artificial renewal program amounted to 4,025 ha (3,358 ha of planting and 667 ha of seeding), representing 46% of the planned artificial renewal target. The shortfall in the artificial renewal target is attributed to the reduction in the harvest operations. Sites that would have been planted were not harvested. It is evident that AbitibiBowater's renewal program has outpaced harvest levels over the first four years of the audit term (7,727 ha harvested versus 15,138 ha renewed).

Artificial renewal methods primarily take the form of tree planting. Only one aerial seeding project was undertaken. This was on a jack pine site that had been salvage harvested following a fire. Most artificial renewal was preceded by some form of mechanical site preparation although many sites may also be planted directly. Chemical site preparation using Vision®, VisionMax® or Catena® (glyphosate products) was used on some highly productive sites to control unwanted vegetative competition.

Container stock is used exclusively in the planting program. Black spruce, white spruce, and jack pine, and small amounts of red and white pine, are planted. The planting of red and white pine coincides with the objectives and strategies of the FMP to maintain or increase the size of the red and white pine forest unit across the NHF. Natural ingress of conifer was evident across the range of site types inspected because of the use of CLAAG during harvest operations.

The auditors found several examples where trees had been planted next to well-established natural conifer regeneration. This practice reduces the efficiency and benefit of the planting program. AbitibiBowater has a protocol that addresses this occurrence, but there is room for improvement in its application.

Site preparation and planting was delayed on one large block and the area is now experiencing heavy grass and brush competition. There was one other newly planted block where heavy grass competition is likely to threaten crop tree growth and requires an immediate tending treatment.

Other than these few examples, the audit team witnessed an effective planting and seeding program. Sites were treated promptly and with appropriate prescriptions.

AbitibiBowater is making a significant effort to maintain a conifer component in mixedwood forest units. Selective ground-spraying has been conducted to suppress shrub competition and release conifer regeneration. These productive sites are very challenging to renew but efforts appear to be paying off.

Renewal in the hardwood forest units, which rely on natural regeneration, has been effective with a notable exception in some of the poplar stands that were salvage harvested. Poplar suffered higher than expected mortality in these stands following a prolonged outbreak of forest tent caterpillar coincident with very dry growing seasons. Salvage harvesting was conducted but apparently there was insufficient vigour left in the root systems of the poplar to support normal levels of suckering. On several sites visited by the audit team, brush growth has proliferated. In the opinion of the auditors, successful regeneration is unlikely to occur without further silvicultural intervention on these sites. The audit only sampled sites that had been harvested, and the issue may well extend to all poplar sites that have been depleted during this forest tent caterpillar outbreak. The areas affected on the NHF are significant and, therefore, the auditors recommend that this issue be addressed jointly by OMNR and AbitibiBowater. The auditors note that the poplar decline has been considered in the 2008 FMP planning process, and the contributions of these sites to future wood supply projections has been sensibly reduced. Nevertheless, it is a significant area of productive forest that should be rehabilitated.

Recommendation # 7: AbitibiBowater and OMNR Region and District shall immediately develop an action plan to rehabilitate the poplar stands that have succumbed to the forest tent caterpillar infestation.

Renewal treatments were generally effective and conformed to the SGRs, noting the exceptions described above. The prescribed practices for each site and the desired future forest unit were suitable and were consistent with the Forest Operations Prescriptions. Documentation of the process of decision-making for Forest Operations Prescriptions is somewhat weak. There were instances where the auditors found it difficult to conclude which prescription applied to the site being inspected. Although the auditors are confident that the prescriptions being applied are appropriate, and that AbitibiBowater staff are very familiar with the landbase, there is room to improve the rigour of documenting the prescription process.

One aspect of the renewal program that requires attention is the reporting of natural renewal in the Annual Reports. There is reluctance on the part of AbitibiBowater to report natural renewal promptly until staff feel assured that the treatment will be successful. Sites that are intended for natural renewal may not be reported for a number of years. This practice is not consistent with the FMPM, which requires that areas intended for natural regeneration be reported in the year in which harvest occurred. A recommendation addressing this issue is found in Section 3.6.3.

Areas identified for renewal treatment were approved in the FMP or FMP amendments and appropriate AWS. Treatment areas are being accurately mapped, tracked, and reported in the required Annual Reports, although there is the issue with natural regeneration reporting as noted above. AbitibiBowater makes effective use of their geographic information system (GIS) to manage their landbase. Stands and treatment areas requiring follow-up work or assessment are denoted in the database accordingly. The database is queried as needed to outline treatment programs on an annual basis.

3.4.5 Tending and Protection

Tending activities occurred on 7,310 ha over the first four years of the audit term, including 6,922 ha of aerial herbicide application, 361 ha of ground herbicide application, and 27 ha of manual cleaning. This achievement exceeds AbitibiBowater's planned five-year tending program by 1,228 ha. Overachievement of the five-year targets was recorded for all forms of tending. Aerial chemical application exceeded the target level of 5,813 ha, ground chemical application was planned for 269 ha, while manual tending had not been anticipated when the 2003 FMP was prepared. The additional effort was attributed to higher than planned competition on conifer renewal sites. This serves as an indicator of an effective silvicultural monitoring program. A 27ha manual tending project using brushsaws was undertaken in 2005 to remove undesirable competition in a Great Lakes-St. Lawrence transitional mixedwood stand. The objective of the operation was to ensure the survival of species uncommon to the NHF (e.g., yellow birch) in response to a recommendation in the 2003 independent forest audit.

For chemical tending applications, glyphosate was applied with helicopters or with skidder-mounted air blast sprayers. Ground application of herbicides was used on mixedwood sites where a more selective application was required.

AbitibiBowater staff determines the need for tending applications by conducting aerial inspections one to three years following treatment on both artificial and natural renewal treatment areas. Proposed treatment boundaries are confirmed during these flights, and application rates and priorities are subsequently assigned to each block. The aerial inspections are also used to assess the effectiveness of chemical tending treatments from the previous year.

Recommendations for follow-up treatment, such as tending to control undesirable competition, may also originate from the plantation survival assessment reports or later stocking assessments collected through ground surveys by AbitibiBowater personnel. This data forms the basis for decision-making in the current AWS or recommendations for AWSs in subsequent years. Assessments appear to have been carried out conscientiously and effectively.

In general, the audit team witnessed an effective tending and renewal program, where efforts are made to apply tending treatments promptly, discriminately, and with appropriate prescriptions. Appropriate buffer zones were established around values and were avoided during operations, except for one incident which is described below. Two incidents of off-target aerial spraying were reported under the compliance inspection program but the incidents did not compromise the integrity of any values. Conformance with the SGRs was apparent. The prescribed tending for each site was consistent with the Forest Operations Prescriptions, and should maintain forest productivity. Areas identified for treatment were approved in the FMP or FMP amendments and appropriate AWSs. Treatment areas are being accurately mapped, tracked, and reported in the required Annual Reports.

Two non-compliances were reported in a program that was otherwise conformant with the AWSs and other applicable legislation. One incident was identified where herbicide was aerially applied outside an approved spray block at four different locations during the 2004-2005 season. An error in the data fed into the helicopter's electronic navigational system resulted in the misapplication. This was assessed as a minor non-compliance and a warning was issued to AbitibiBowater. The auditors agree with the outcome of OMNR's investigation regarding this incident. However, the non-compliance was not noticed until a treatment verification flight in September 2005 and verified further when AbitibiBowater personnel examined copies of the helicopter navigational tracks while preparing the 2004-05 Annual Report during October 2005. This incident should have been detected and reported in a more timely manner.

AbitibiBowater should obtain GPS navigational track information from their chemical application contractors as soon as possible following completion of each project and examine these files immediately to ensure that chemical applications are confined to the approved project boundaries.

The second incident occurred during 2006-2007 when the contractor carrying out the ground chemical application crossed the established project boundary at three locations and treated 20 ha that had not been designated for treatment. This non-compliance was deemed to be of "minor" significance.

No protection treatments against insects or diseases were carried out during the audit period.

3.4.6 Renewal Support

AbitibiBowater is a founding and active member of the Northeast Seed Management Association, a member-driven cooperative organization with a mission to carry out tree improvement activities in northeastern Ontario. Three of the seed orchards managed by the Northeast Seed Management Association produce seed that is used for renewal programs on the NHF and the Evelyn Township seed orchard is located on the NHF. All of the work conducted on the tree improvement areas is coordinated by staff of the Northeast Seed Management Association. All black spruce seed used in the stock production program is derived from improved seed that is collected at three first generation seed orchards.

Work conducted at the Evelyn Township seed orchard during the 2003-2008 audit term consisted of flower induction, breeding, crown management, data collection, nutrient application, and cone collection. These activities were usually, but not always, described in the applicable Annual Report. For example, 12.63 hl of cones collected during 2006-2007 and 3.9 hl of cones collected in 2005-2006 are not reported in the appropriate Table AR-8. This information gap should be rectified.

Recommendation # 8: AbitibiBowater shall ensure that all tree improvement activities occurring on the Nighthawk Forest are appropriately recorded in Table AR-8 of the annual report in accordance with the requirements of the Forest Management Planning Manual.

The planned tree improvement work was broadly described in the AWSs but there were no specific targets given. The lack of specific targets compromises the ability to quantity performance. It is suggested that AbitibiBowater add specific targets to its renewal support plans in the future in order to make program assessment more meaningful.

Large quantities of black spruce seed were collected prior to 2003 to be used for aerial seeding applications. The rise in the use of CLAAG reduced the need to use the collected black spruce seed for direct seeding and much of it remains in storage. Nearly 500 million seed are available (Table 3), which is sufficient for the requirements of the artificial renewal program. Over the first four years of the 2003-2008 audit term, 3.46 million container stock trees were produced and 25.8 million seeds were used in an aerial seeding operation.

Table 3. Seed stored for future use on the Nighthawk Forest.

Species	Number of Seeds in Storage
Jack pine (improved seed)	112,991
Jack pine (general)	17,273,001
White spruce (general)	302,717,832
Black spruce (improved seed)	1,866,543
Black spruce (general)	177,578,105
White pine	309,399
Red pine	18,232
Total	499,876,103

The forecast for container stock requirements in the 2003 FMP was to produce 7.61 million container stock over the first four years of the audit term. Only 45% of this target was achieved. The shortfall was primarily attributed to the reduction in harvesting (only 55% of the area forecasted for planting was harvested), which resulted in less area available for replanting. There was a slightly greater reduction on the sites where intensive silvicultural treatments would have been implemented.

Through its participation in the Northeast Seed Management Association, AbitibiBowater receives genetically improved black spruce and jack pine seed on a continuous basis. This stable supply has negated the need to conduct a general collection program for these species. A program to develop a second generation of improved seed is currently under development. The Company has acknowledged that red pine seed requires replenishment. Efforts are continuing to monitor the red pine cone crop for future collection programs.

3.4.7 Access

The NHF has a well-developed infrastructure for access. Its boundaries encompass the City of Timmins and several other municipalities, parts of the provincial and municipal highway systems, and many concession roads that interconnect with the highway systems. There is a long history of road development in the area to support the agriculture and mining sectors. No primary road construction was planned during the audit period and five secondary (or branch) roads, totaling 39 km were planned for construction. Forty-eight km of tertiary, or operational, roads were planned for construction over the term.

The actual locations for the two secondary roads that were constructed during the five-year audit term were compared against the planned locations in the FMP. In both cases, the roads were located correctly within approved corridors.
Road construction is carried out by the overlapping licensees who follow rigorous standard operating procedures that have been established by AbitibiBowater through its Forest Environmental Management System. Particular attention is paid to roads that encroach on, or cross over, AOCs such as waterways. AbitibiBowater and overlapping licensees have cooperatively developed a comprehensive stream-crossing toolkit that provides guidance for the planning, construction, maintenance, and removal of crossing structures that have a span length or culvert diameter less than 3 m for all classes of roads, including temporary winter stream crossings. This document serves as an excellent resource and checklist to the licensees and their contractors and is included as an appendix with the AWS submissions.

The audit team travelled extensively on NHF roads, in addition to an aerial inspection during the field audit, and was satisfied that construction practices for new roads were generally good to excellent. Care was taken to minimize environmental impacts and road rights-of-way were constructed within the maximum allowances. Sufficient cross-culverts were being installed to alleviate drainage issues. Grading practices were good to acceptable, with the noted exception of the Forks River Road and the Matachewan Road. On these particular roads, roadside vegetation was excessively removed by grading and grubbing work to within 100 m of a few stream crossings. Discussion with OMNR and AbitibiBowater personnel revealed that the maintenance work was being conducted by a mining exploration firm. The OMNR is in the process of investigating and resolving this matter. Roads are generally well-maintained with few problems. The exception is noted for some older water crossings.

The great majority of new crossings installed during the period were well-constructed and conformed to recommended practices, guidelines, and AWS proposals. One temporary bridge construction across the Grassy River was particularly well-done, with river banks appearing virtually undisturbed. Diversion ditches, sediment traps, and rip-rap were used to control erosion around the new water crossing structures. Bridge decks were covered with geotextile material to prevent sediment from entering the waterways. All new culverts were properly installed, with appropriate pipe lengths and widths and suitable sloping being employed around the structures.

The Sucker River bridge on the Blount Road was a notable exception to this positive assessment. There have been ongoing issues to stabilize the road banks and approaches to this bridge. A significant slump occurred on the southern approach during construction of the bridge in 2005; approximately 14 truckloads of gravel and coarse sand were released into the river, despite construction being implemented according to approved specifications. Appropriate remedial work has been undertaken and the situation now appears to be stabilized.

Older crossings were not constructed to the specifications and practices that are utilized today and are starting to fail. For example, culverts may be too short or were constructed with erodable materials. Plugged culverts were found, which could progress to more serious damage, leading the auditors to surmise that insufficient attention is being paid to the older culvert installations. AbitibiBowater has a monitoring program in place to regularly inspect the older crossings at least once every three years. In the event that a washout or a physical hazard is discovered, which could present safety or environmental concerns, AbitibiBowater, the overlapping licensees, and OMNR have established a procedure for taking remedial action. The auditors support the procedure, but observations suggest that it is not applied with sufficient rigor. More attention is needed on the part of AbitibiBowater and OMNR to address these failing crossings. This has been addressed in Recommendation #4.

Management of the roads was consistent with the strategies that were developed in the 2003 FMP. Six roads were scheduled for natural or physical abandonment, which were carried out as scheduled. A target to actively rehabilitate or abandon 75% of newly created, or upgraded, tertiary roads was established in the 2003 FMP. Interviews with AbitibiBowater staff determined that active rehabilitation had been taking place, as witnessed in the field by the auditors. However, the extent of the rehabilitative work had not been closely tracked annually.

According to interviews with AbitibiBowater and OMNR staff, there were two Category 9 aggregate permits utilized in the construction or maintenance of any roads during the audit term. The Compliance Assessment Report for one of these pits was inspected. One Category 14 aggregate permit area was examined and found to be operating in compliance with the Aggregate Resources Act standards. Compliance monitoring did not identify any issues with the operations in the aggregate permit areas.

In 2006, the Ontario provincial government developed a funding program (the Road Construction and Maintenance Agreement) to assist the forest industry in offsetting road construction and maintenance costs for roads meeting the criteria for the program. During the last three years of the audit term, AbitibiBowater qualified for assistance to maintain a number of primary and secondary roads and were reimbursed for maintenance costs as shown in Table 4. AbitibiBowater did not apply for funding for road construction activities.

Table 4. Reimbursements from the Road Construction and Maintenance Agreement to AbitibiBowater for road maintenance for the last three years of the audit term.

	2005-06	2006-07	2007-08	Total
Actual cost of invoices for maintenance work reimbursed ($)	656,760	1,003,368	1,003,081	2,663,209

Actual total kilometres of maintenance work completed (km)	246.7	279.5	180.6	706.8

Maintenance work included road re-alignments, bridge and culvert replacements and repairs, road base improvements, gravelling, brushing, sign repairs, summer grading, and snow plowing. The auditors were required to sample 10% of the roads that had received funding. Although the audit team did not keep formal records of all road visits, a review of field notes confirms that more than 60% of the sites that received maintenance under this program were visited. The audit team found ample evidence that the work for which the funding was provided had been carried out.

3.5 Systems Support

3.5.1 Human Resources

Human resources are addressed by AbitibiBowater as part of their CSA certification. In the new protocol for independent forest audits, companies which have achieved independent certification are assumed to be compliant with this indicator. This means they meet the requirements for employee awareness, education, and training programs necessary to ensure current general and specific knowledge to meet each person's responsibility in the sustainable forest management system.

3.5.2 Documentation and Quality Control

The Information Technology department of AbitibiBowater performs several layers of document backup. Both local backup and regular scheduled corporate backup procedures are followed for important documentation. Documents for the FMP were on-site in hard copy and centrally stored for audit purposes, as required. AbitibiBowater appears compliant with Forest Information Manual requirements, including technical requirements for base values, FRI, FMPs and their amendments, AWSs, and electronic submissions.

A previous independent forest audit recommended that proper records are kept of all required public notices on the Driftwood Forest as outlined in the FMPM. This was verified for the 2008 FMP planning documentation.

3.6 Monitoring

3.6.1 District Compliance Planning and Associated Monitoring

The NHF falls within the administrative boundaries of three OMNR Districts (Timmins, Cochrane, and a small portion of Kirkland Lake). To simplify administration of portions of the compliance monitoring program on the NHF, an arrangement has been established whereby Timmins District acts as the lead district. Each district has staff assigned for conducting compliance monitoring on the NHF.

Both OMNR Timmins and Cochrane Districts prepared a District Compliance Strategy that covered the five-year period 1999-2004. In 2006, OMNR changed its compliance planning policies and no longer required districts to prepare multi-year compliance strategies.

The auditors found that both districts had prepared the required Annual Compliance Operating Plans during the audit period. Planned activities for the Forests program included conducting joint field inspections, verification audits on SFL holder operations, maintenance of the compliance monitoring database, training for district staff, and annual compliance meetings with AbitibiBowater staff. Quantitative targets were assigned to most of the measures listed in the Compliance Activity Schedule of the Annual Compliance Operating Plans and were allocated by area team (Timmins District) or program area (Cochrane District). The Compliance Activity Schedule includes space for actual completion and review/analysis comments at the end of the operating year. Timmins District had completed this review information for most years. This self-assessment indicated that the District had met nearly all of its forest compliance targets, with the exception of conducting compliance audits.

The audit team's inspection of field sites and compliance reports confirms that OMNR is meeting the level of monitoring targeted in the Annual Compliance Operating Plans, which was to verify 10% of compliance inspections submitted by AbitibiBowater. Figure 2 illustrates the number of compliance inspections undertaken by OMNR and AbitibiBowater on the NHF, relative to the level of harvest, during the audit term.

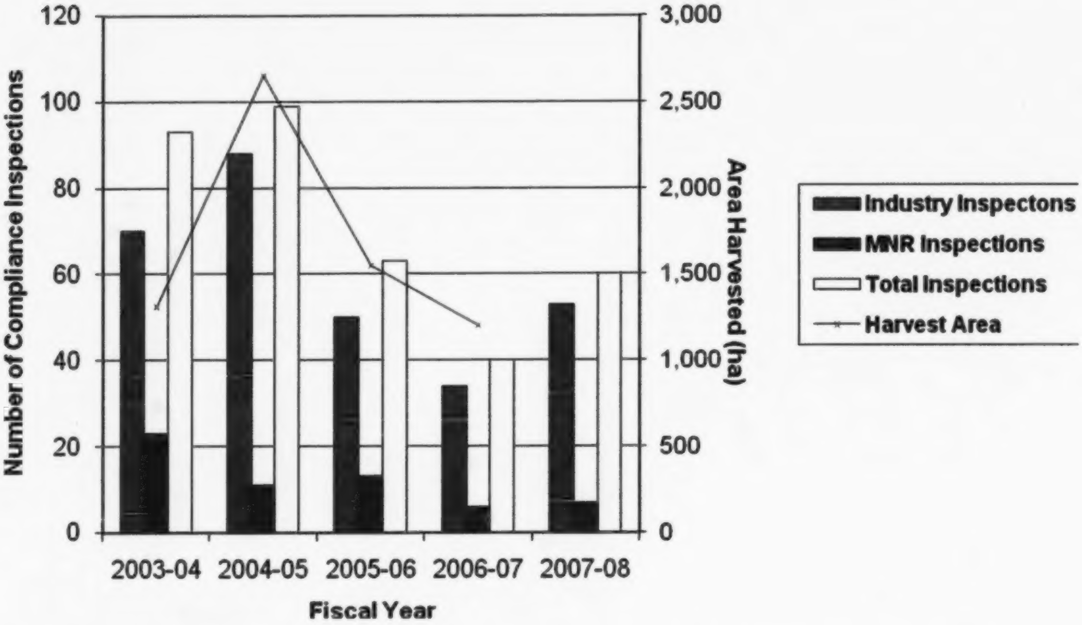

Figure 2. Number of compliance inspections showing hectares harvested per year on the Nighthawk Forest.

Timmins, Kirkland Lake and Cochrane Districts, AbitibiBowater, and two overlapping licensees (Domtar Inc. and Tembec Inc.) submit their Forest Operations Information Reports directly to the provincially-sanctioned Forest Operations Inspection Program (an internet web-based interactive computer software program). All reporting is documented in a digital format, which allows for quick access and retrieval.

A sampling of the reports filed by OMNR districts confirmed that reporting procedures outlined in the respective compliance plans are generally being followed. The compliance reports are being completed with the required information elements. Reference and location information is complete and accurate. Maps and photographs accompany some of the reports. Non-compliances reported by the industry are followed-up by OMNR conducting verification inspections. Timmins District notifies AbitibiBowater's compliance coordinator when reports have been submitted to the Forest Operations Information Program system.

There are currently two staff in the OMNR Timmins District and up to three in the Cochrane District that are certified compliance inspectors and conduct inspections on the NHF on a regular basis. The audit team found that the number of OMNR staff trained to perform compliance inspections is minimally adequate. However, the OMNR performance on the forest is not adequate. The length of time OMNR is taking to resolve and close reported issues is excessive. There are several instances of non-compliance where a resolution was not reached for over six months. In one case, OMNR was unable to issue a penalty as recommended during its investigation because the two year statute of limitations had been exceeded.

A sampling of the Forest Operations Inspection Reports submitted by OMNR reinforced this finding. Approximately 50% of the sampled reports were not submitted within the prescribed timeframes. Consequently, the audit team concludes that the level of compliance oversight by OMNR is inadequate. The effectiveness of OMNR's compliance monitoring program was the subject of recommendations in the 2003 independent forest audit. Both Timmins and Cochrane Districts need to re-examine their compliance monitoring programs and determine how their staff resources can be more effectively deployed to meet their obligations.

Recommendation #9: The OMNR Districts shall review their Forest Operations Compliance Monitoring programs to ensure that adequate resources are available to meet their obligations. Districts shall regularly review and monitor their progress towards meeting their compliance monitoring targets and take immediate steps to address shortfalls. Further, Districts must take more vigilance to ensure that all compliance reports are submitted within the timeframes outlined in the Forest Information Manual.

The annual reports for the NHF showed that communication and coordination on compliance monitoring reporting between the Timmins and Cochrane Districts requires improvement. The OMNR is required to submit their analysis and commentary on compliance inspections by September 15 of each year. Each district submits its analysis separately with no coordination or total summary being undertaken. In some instances, no analysis was submitted at all. As a result, the analysis of compliance monitoring matters from the OMNR perspective is often incomplete, disjointed, and sometimes inaccurate. For example, Table AR-12.2 in the 2003-2004 Annual Report only lists reporting information from the Timmins District. This inaccurate table also appears on the public OMNR website.

Recommendation # 10: Timmins and Cochrane Districts shall improve their level of communications and coordination when reporting on compliance monitoring matters for the Nighthawk Forest.

3.6.2 Sustainable Forest License Holder Compliance Planning and Monitoring

AbitibiBowater prepared a five-year compliance plan covering the audit period, which was approved by the OMNR Timmins and Cochrane Districts.

The five-year plan met all of the requirements outlined under the Forest Information Manual and OMNR's *Guideline for Forest Industry Compliance Planning* (OMNR 1998).

The plan includes a background description of the NHF, as well as sections dealing with goals, objectives, and strategies. Monitoring and reporting procedures are outlined, measures for dealing with non-compliances are described, and roles and responsibilities for implementing the compliance program are defined. The plan is very complete and well written. In the opinion of the auditors, the compliance plan is sufficient and appropriate for the operations that were anticipated on the NHF.

AbitibiBowater also prepared Annual Compliance Plans of Action for each of the five years within the scope of the audit. These plans are included as appendices in the respective AWSs and list the priority areas for compliance effort. A protocol for monitoring, inspection, and reporting is described, including remedial action procedures to be followed when non-compliances are found. Criteria for inspection data reporting are briefly listed as well. AbitibiBowater is responsible for all compliance activities on the licence area, including those of the overlapping licensees that are not considered as a "qualified overlapping licensee".

A qualified overlapping licensee is given responsibility for their own compliance monitoring. Domtar Inc. and Tembec Inc. are approved as qualified overlapping licensees. Sustainable Forest License holders do not have responsibility, nor are liable, for compliance infractions related to forest operations incurred by the qualified overlapping licensee. Overlapping licensees are expected to implement the Annual Compliance Plans of Action on their respective operations.

AbitibiBowater, Domtar Inc., and Tembec Inc., used the Forest Operations Inspection Program software for reporting compliance monitoring inspections for access, harvest, renewal, and maintenance operations. All reporting is documented in a digital format, which allows for quick access and retrieval. The auditors reviewed the inspection reports and were generally satisfied that the level of monitoring on the NHF was very effective for most aspects of the program. The auditors found water-crossings that were washed-out or plugged and required attention, suggesting that improved monitoring could be beneficial with regard to access roads and water crossings.

The other six overlapping licensees retain certified inspectors that carry out the inspections for their operations and submit the reports to AbitibiBowater for approval.

A sampling of the reports filed by AbitibiBowater and the qualified overlapping licensees confirmed that they were completed in a satisfactory fashion and procedures outlined in the compliance plans were generally followed, but the reports may not have been completed in a timely manner. Examination of the evidence demonstrated that approximately 50% of the routine compliance reports were not submitted within the timeframes specified in the Forest Information Manual and OMNR compliance policies. Delays in submitting some of the reports, particularly those with no negative findings, have been quite lengthy.

Recommendation # 11: AbitibiBowater and the qualified overlapping licensees shall ensure that all compliance reports are submitted within the timeframes prescribed in the Forest Information Manual and OMNR policies.

AbitibiBowater has been certified ISO 14001 on its operations, which includes the NHF, since 2003 and to the CSA Z809 standard since 2005. Under these certification processes, standard operating procedures, policies, guidelines, and monitoring programs are continually developed which include a strong training and education component. Training is offered internally and externally and delivered to all employees, contractors, and overlapping licensees. One of the overall expectations of the training programs is prevention of non-compliances and continuous improvement.

AbitibiBowater conducts and maintains a robust compliance monitoring program. The auditors found evidence that the Company was seriously committed and proactive in implementing an effective compliance monitoring program on the NHF. One staff member is assigned to coordinate the Company's compliance activities. Seven Company staff are certified compliance inspectors and carry out these functions as a regular aspect of their job duties. Overlapping licensees have at least ten certified compliance inspectors that work full- or part-time for the NHF. The Company has sponsored its own staff and staff of the overlapping licensees to attend the Forest Operations Compliance Inspection Certificate course.

The Company is making a sustained effort to communicate on compliance monitoring issues. Compliance information and indoctrination sessions are held annually with overlapping licensees and contractors to review and update operations. Meetings among AbitibiBowater, overlapping licensees, and OMNR districts are being held on a semi-regular basis to review compliance performance and issues. Joint inspections between forest industry representatives and OMNR compliance staff have been conducted occasionally to clarify specific issues.

AbitibiBowater staff aerially inspects the previous year's operations to verify compliance findings collected from the ground inspections, note any possible issues, and take corrective action as appropriate.

Non-compliances have been reported promptly. AbitibiBowater has adopted a remedial action procedure dealing with all non-compliances that are discovered under the forest management compliance monitoring program. The effectiveness of the Company's compliance monitoring program and its commitment to continual improvement and prevention of non-compliances is reflected in its compliance record. Non-compliance frequency has been dropping since 2005-06, with only one non-compliance reported during the 2007-08 season. Of the 19 non-compliances reported over the 2003-08 audit term, all but one were deemed to be "minor" in significance. One non-compliance was deemed to be of "moderate" significance.

Comments from OMNR staff with respect to the Company's implementation of its compliance monitoring program were positive.

AbitibiBowater's environmental management system includes strong employee training and preventative action components.

Judging from the examination of the evidence, observations during field visits, review of compliance reports, and interviews with industry and OMNR staff, the auditors conclude that the Company and the qualified overlapping licensees are providing an effective oversight role in the conduct of its compliance monitoring program on the NHF.

3.6.3 Silvicultural Standards and Assessment Program

The 2003-2008 and 2008-2018 FMPs describe AbitibiBowater's general program for monitoring silviculture effectiveness, the purpose for collecting the data, and how the information is used for assessing effectiveness of silvicultural treatments and developing the growth progression assumptions used in forest modeling exercises. However, there is not a single stand-alone document that details the silviculture effectiveness monitoring program in an inclusive manner. Helpful details about the monitoring methodologies and procedures were obtained through interviews with staff. Monitoring activities may include survival assessments for plantations, stocking and height assessments of the renewing stand, and FTG surveys.

Overall assessment of silviculture effectiveness is conducted on a forest-wide basis through regular reporting as required by the FMPM and the Forest Information Manual. Data is compiled and evaluated annually through the annual reporting process. AbitibiBowater provides commentary and an evaluation of program achievements and effectiveness when the reports are submitted.

The audit team's field visits, coupled with an examination of the documentation, confirmed that the boundaries of the sampled FTG field locations had been properly mapped and accurately recorded in the reporting system. As well, observations in the field supported the assessment of FTG status and, in most cases, agreed with the new stand descriptors. There were two instances where the recorded stand description provided to the audit team did not match the stand composition observed in the field. It became apparent in these situations that the assessor had aggregated, rather than stratified, the stands where there were obvious differences in stand characteristics.

Stand descriptor and assessment issues have also arisen from audit assessments that have been conducted by OMNR Timmins District. The level of auditing conducted to date on the NHF by OMNR has been limited due to funding and staffing shortfalls. Analysis and discussion over the limited audit data collected to date is ongoing. The auditors encourage OMNR and AbitibiBowater to continue to compare the Silvicultural Effectiveness Monitoring audit data collected and to clarify any issues or disparities as early as possible.

Silvicultural assessments are conducted on a regular systematic basis. Areas that are harvested and renewed (artificially or naturally) are initially assessed one to five years following treatment to determine if any tending or other remedial treatments are required. Timing of the assessments depends on the prescriptions that have been applied to a particular forest stand. These assessments are performed on the ground or via helicopter. The evaluation results are mapped and tracked using AbitibiBowater's GIS system. For areas that are aerially tended with chemicals, a visual assessment via air or ground is conducted the following year to assess treatment effectiveness. Areas where natural conifer regeneration is expected or areas that have been naturally disturbed (e.g., wildfire) are assessed five to twelve years following the disturbance event. The assessment determines if the stand has met the FTG standards, or if remedial action is required to ensure the regeneration standards will be met. Treatment response and silviculture treatment effectiveness are assessed by comparing regeneration standards in the SGRs to the resulting forest condition determined during the FTG regeneration surveys. The results of assessments are utilized for planning purposes.

Early performance of the planting renewal program is assessed by establishing planting stock survival plots immediately following renewal treatments. The plots are used to evaluate performance of different stock types, regeneration condition, and regeneration survival rates. Should problems be noted during assessment, plans for remedial follow-up work are formulated.

The results of the FTG surveys are reported annually in Table AR-14, and are tracked by silvicultural treatment package. This format allows an assessment to determine if the treatments were a "silvicultural success" (the objectives of the treatment package were attained by reaching the FTG standard for the predicted forest unit) or a "regeneration success" (reaching the FTG standard for a forest unit other than predicted). Analysis of the results for the audit term indicate that the level of silvicultural success overall is somewhat unsatisfactory at 55%, and the mediocre results for two years may be cause for concern. Certainly the results for 2004-2005 and 2005-2006, where the levels of silviculture success only reached 43% and 57%, respectively, merit further analysis into possible causes. Comments or analysis on the level of silviculture versus regeneration success were not offered in the annual reports, as required by the FMPM. The analysis of silviculture success is useful not only for assessing silviculture effectiveness but also plays a role for rationalizing and adjusting input parameters to the forest modeling exercise.

Recommendation # 12: AbitibiBowater shall provide analysis on the level of silvicultural success being achieved in the text of the annual reports being prepared for the Nighthawk Forest.

Over the first four years of the audit term, 16,659 ha of renewal areas were surveyed for regeneration success, which represents 105% of the planned level of 15,829 ha. According to the annual reports, all of the areas surveyed met the FTG standards. Discussion with AbitibiBowater personnel, however, revealed that not all of the areas surveyed meet the FTG standards. They simply defer reporting the unsuccessful areas until they meet the standards.

This matter of non-reporting was brought to AbitibiBowater's attention by OMNR during its review of the 2004-2005 annual report submission. Unsatisfactory assessment results do not necessarily signify failed silvicultural treatments. They may simply indicate that timing of the assessment is premature, owing to site conditions which may influence growth rates. Not reporting unsuccessful results defeats the benefits of gaining a better understanding of why the results occurred. It is essential that FTG assessment results be fully reported, so that the appropriate analyses can be undertaken for use in the preparation of future FMPs.

Recommendation #13: AbitibiBowater shall fully report the results of its free-to-grow surveys annually as per the requirements of the Forest Management Planning Manual.

The auditors are satisfied that AbitibiBowater maintains a robust silviculture effectiveness monitoring program on the NHF and that the level of monitoring is keeping pace with the past levels of harvest and the levels of surveys projected in the FMP. The two recommendations raised in this section both address reporting issues. The auditors are confident that AbitibiBowater is monitoring its silvicultural efforts effectively.

3.6.4 Monitoring Indicators of Forest Sustainability

The measurable indicators of forest sustainability must be monitored to provide the assessment of forest sustainability to be included within the RPFOs.

A set of criteria have been developed under Ontario's forest management planning framework which address the required CFSA objective categories and indicators for determining sustainability on a management unit. The criteria are identified in the 2004 FMPM as follows:

- Conserving biological diversity;
- Maintaining and enhancing Ontario's framework for sustainable forest management;
- Maintaining and enhancing forest ecosystem condition and productivity;
- Providing for a continuous and predicable flow of economic and social benefits from Ontario's forests;
- Protecting and conserving Ontario's forest soil and water resources;

- Accepting society's responsibility for sustainable development;
- Maintaining and enhancing frameworks for sustainable forest management.

There are three main types of indicators used for assessing objective achievement in the 2008 FMP: 1) forecasting, 2) monitoring, and 3) compliance. Forecasting indicators calculate the anticipated future forest condition and are used in assessing the sustainability of the proposed management strategy. Monitoring indicators assess the implementation of the proposed management strategy by comparing actual achievements against stated forest management plan objectives. Compliance indicators assess operational practices to determine compliance with regulatory requirements, identify compliance issues, and help identify training needs. Compliance indicators also assist in determining if operational practices are compromising the longterm sustainability of the NHF. Of the 58 objective indicators for the NHF, 16 are forecasting indicators, 28 are monitoring indicators, 12 are compliance indicators, one is a combined forecasting/compliance indicator, and one is a combined forecasting/monitoring indicator.

The forecasting indicators (e.g., frequency and area distribution of planned disturbances; long-term projected available harvest area and volume by species group; area of habitat for forest-dependent, provincially- and locally-featured species) are calculated at the time of plan preparation. Twenty-four of the indicators are fully or partially assessed at the time that the FMP is prepared. For the monitoring and compliance indicators, the Company has protocols and established practices in place for collecting the needed data for assessment. Many of these practices have been in place for a number of years. The auditors are fully confident that the Company has the capability to compile the data necessary to measure its progress for the sustainability indicators.

The auditors noted that the Company attempted to address the issue of assessing forest sustainability in the 1998-2003 RPFO that was prepared for the NHF. Assessing forest sustainability was challenging as the data assembled for the RPFO was derived from the former forest management units that now comprise the NHF (Timmins Forest, Timmins Crown, and Driftwood Forest). Some datasets proved impossible to amalgamate or were not comparable to new algorithms that were employed to derive similar datasets.

The audit and survey procedures employed to collect data used to analyze sustainability criteria are appropriate and relevant. Considerable volumes of data are derived from FRI datasets which have been consistently updated and are analyzed using contemporary GIS systems. The Company conducts an effective and regular compliance monitoring program. The survey and data collection systems also serve a cross-purpose of collecting data for assessing objectives and targets associated with its Canadian Standards Association (CSA) certification. Through its normal standard operating procedures (e.g., compliance monitoring system, FTG assessment program, etc.) the

Company is regularly collecting and recording the tabular and spatial data needed to meet the FMPM requirements.

The auditors are confident that the Company possesses the appropriate means for measuring progress and achievement of the objective indicators established in the 2008 FMP. Much of this data can be derived from the Annual Reports, compliance monitoring programs, silvicultural effectiveness monitoring, and other reporting systems that the Company has in place. The methodologies employed for the collection of data conform to relevant guides that are sanctioned by the Province where there are guides in place. Based on the evidence observed by the audit team, the Company will be in a good position to carry out the appropriate sustainability analysis when it is required.

3.6.5 Annual Report

Annual reports prepared by AbitibiBowater for the first four years of the 2003-2008 audit term were available for the auditors to examine. The 2007-2008 annual report was not available since it was not due for submission before the auditors were preparing the draft audit report. The 2003-2004 annual report consisted of two parts, a spring submission and a fall submission, prepared in accordance with the 1996 FMPM. Starting in 2004-2005, annual reports were submitted as a single package, due by November 15 of each year, and were prepared in accordance with the 2004 FMPM. AbitibiBowater has submitted their annual reports on time.

The annual reports are generally of good quality and conformed to the requirements of the relevant FMP manuals, with a few exceptions. Some tables were found not to be completely filled out according to the requirements; numbers from previous years were not carried over for "to-date" reporting, or inconsistencies were found in the totals. Examples are shown in Table 5.

Table 5: Discrepancies found in Annual Report tables submitted by AbitibiBowater.

Annual Report Year	Table	Problem
2004-05 2005-06 2006-07	AR-7	• Slash pile burning from 2003-04 not included in "to date" column • Table version is out of date • "% forecast" values for natural renewal not completed
2004-05 2005-06 2006-07	AR-14	Results from 2003-04 not included in the "to date" columns
2006-07	AR-6	Table missing from submission
2006-07	AR-7	Errors in "actual to date" column

Harvest areas observed in the field were properly recorded in the required tables and maps that accompany the annual reports. Comparisons of the annual report depletion maps and detailed harvest tables confirm that the depletion information is accurately recorded.

As identified in Recommendation #13, AbitibiBowater must correct the way it reports natural renewal in Table AR-7 of the annual report. There is reluctance on the part of AbitibiBowater to report natural renewal promptly; the tendency is to wait until staff feel assured that the natural regeneration is successfully established before reporting it. This practice is not consistent with the requirements of the FMPM.

A review of the forest operations compliance sections shows that a total of 355 compliance inspections were completed during the audit period, including 295 by the forest industry (AbitibiBowater and the overlapping licensees) and 60 by OMNR. Table 6 summarizes the compliance inspection program conducted by each organization. A total of 19 incidents of non-compliance occurred over the audit period. Fourteen were reported by AbitibiBowater and five were reported by OMNR inspectors. All but one of the non-compliance incidents investigated by OMNR were categorized as minor in significance. One incident was rated as moderate. None of the reported non-compliances were considered to be significant.

Non-compliances were primarily reported for activities related to access, harvesting, or renewal. Since many of the non-compliances were minor in nature, they were usually resolved through voluntary corrective action by the forest industry. Notices of warning were issued for five of the incidents. In one instance, OMNR recommended a penalty for an incident where site preparation was carried out beyond the approved boundaries, but the two-year statute of limitations had been exceeded. No other penalties were assessed during the audit term.

Table 6. A summary of compliance inspections conducted on the Nighthawk Forest by AbitibiBowater, overlapping licensees, and the OMNR.

Compliance Inspections by AbitibiBowater and Overlapping Licensees 2003-2008			
Activity Inspected	Total Number of Reports	Number in compliance	Number of Non-compliances
Access	130	125	4
Harvest	125	120	5
Renewal	33	30	3
Maintenance	7	6	2
Protection	0	0	0
TOTAL	295	281	14

Compliance Inspections By OMNR 2003-2008			
Activity Inspected	Total Number of Reports	Number in compliance	Number of Non-compliances
Access	27	22	5
Harvest	30	30	0
Renewal	2	2	0
Maintenance	1	1	0
Protection	0	0	0
TOTAL	60	55	5

The combined compliance statistics for AbitibiBowater and OMNR demonstrate that there has been a significant decreasing trend in the frequency rate of non-compliance reports over the last three years of the five-year audit term. The overall frequency rate of non-compliance reports for the audit period is 5.4%, with AbitibiBowater identifying non-compliance in 4.7% of reporting while OMNR discovered non-compliances in 8.3% of compliance reports. One reason for the higher OMNR results may be OMNR's tendency to direct their monitoring efforts toward high-risk areas, such as AOCs and water-crossings, whereas industry inspection reports cover broader aspects of operations with various risk rankings. Taking into account the observations made in the field and interviews with AbitibiBowater and OMNR staff, the auditors did not consider this difference to be significant.

The actions taken in response to the non-compliances were appropriate. In all cases, AbitibiBowater and overlapping licensees were cooperative by reporting and taking corrective action and remedying the situation promptly. None of the non-compliances, in the opinion of the audit team, offered a threat to the values of sustainability of the NHF. Field visits did not reveal any significant issues where non-compliance was not reported.

The annual reports provide a list of the roads that received monitoring during the operations year and adequate explanations of any issues that were found. Any significant events or observations related to road monitoring, maintenance, or construction were described. There are no access controls imposed on any roads on the NHF.

There were no exceptions to the silviculture guides approved in the 2003 FMP, therefore no monitoring was required in this regard. In 2005, an FMP amendment was approved to permit AOC prescriptions that were exceptions to the osprey guidelines. A table describing the progress-to-date with the monitoring program was presented in the 2006-07 annual report but no conclusions were offered.

Progress toward achieving FMP targets is presented in various parts of the annual report. Explanations for any significant deviations between the actual level of operations and FMP forecasts are normally provided where such deviations have occurred. The rationale and reasons, when provided, are reasonable. However, more discussion about the effects of the deviations on progress toward overall FMP targets and impacts on the longterm management direction would have been helpful.

The comments section in Table AR-3 could be more descriptive, as suggested in the FMPM. No discussion or rationale is provided for the large overachievement (191%) in chemical site preparation in the 2006-07 annual report. In some annual reports, no explanation is provided why planned roads were not constructed. AbitibiBowater should consider reviewing the use of supplementary tables in the report text to compare and explain progress toward achieving FMP objectives and targets.

Each annual report includes a synopsis section that provides a broad overview of the year's activities. This section is intended to include observations on the levels of operational achievement and explain any implications on the achievement of FMP objectives. Comments here have been sparse. Additional explanations would be beneficial.

The OMNR provides staff with direction regarding the review of annual reports. The most recent direction reflects the requirements of the 2004 FMPM and apply to preparation of the 2004-2005 reports. Under the 2004 FMPM, the OMNR District must review the annual reports for specified milestone years (Year 7 and Year 10 reports) but has the option of accepting the annual report "as is" in other reporting years. From the information available, OMNR elected to review the 2004-2005 annual report. AbitibiBowater staff responded to nearly all of the OMNR review comments, but a few were not addressed. For example, AbitibiBowater was directed to utilize the revised Table AR-7 format, which it has not done. A revised 2004-2005 annual report was submitted, but only in hard copy format.

Judging from the number of errors and omissions found in the 2006-2007 annual report, for example, Timmins and Cochrane Districts should consider reviewing the annual reports more frequently to ensure the reports are accurate and complete.

3.7 Achievement of Management Objectives and Forest Sustainability

The success of forest management activities must be assessed in terms of meeting the objectives they were designed to achieve. By comparing planned activities with actual levels of achievement, it is possible to judge the success of the management plan in terms of satisfying its objectives. Forest sustainability is the overriding objective of the CFSA. By reviewing planning commitments and comparing those to accomplishments detailed in annual reports and the trend data provided by OMNR and AbitibiBowater, the auditors can assess sustainability of the NHF.

3.7.1 Report of Past Forest Operations

The RPFO was a requirement of the 1996 FMPM. The overall intent of the RPFO is to summarize the operations that were conducted during the previous five-year FMP and assess their effectiveness in achieving management objectives and forest sustainability.

The final 1998-2003 RPFO for the NHF was first available to OMNR on April 20, 2006 and updated on September 15, 2008. The report addresses each of the required topics designated in Section 4.0 of the 1996 FMPM, including a summary and evaluation of operations, an assessment of forest sustainability, a summary of achievement of management objectives, a review of model assumptions, a summary of independent forest audits conducted during the 1998-2003 period, and a list of amendments and conclusions.

This RPFO collates information from the three forests (the Driftwood Forest and Timmins Forest managed as SFLs by Donahue Forest Products and the Timmins Crown Forest managed by OMNR) that were merged to form the NHF on April 1, 2003. The RPFO used annual reports as a principal source of data, but was also able to draw on the Final RPFO for the Driftwood and Timmins Forests and the 1991-1996 RPFO for the Timmins Management Unit. A bridging RPFO document for the Timmins Management Unit for the years 1996-2001, if there was one produced by OMNR, was not available to the audit team.

Not surprisingly, challenges were reported in the RPFO in merging data produced by two different organizations for three forests. Forest units were not the same for all the forests, which resulted in the merging of data that was not exactly coincident. There is a good explanation of how the data from the six forest units on the Driftwood Forest and the ten forest units on the Timmins Management Unit were linked to the 13 forest units defined on the Timmins Forest. This is a cumbersome process that will continue into the next RPFO equivalent, the Year 10 Annual Report, as the authors transform the information from the 13 forest units in this area into the 16 forest units identified in the 2003-2008 FMP.

The audit team found that the data presented in the RPFO tables met the requirements of the 2004 FMPM and, within the limits of the assumptions provided in the report and the limited access the auditors had to the 1996-2003 annual reports, accurately reflected operations from the 1998-2003 period.

The report tracks harvest performance by forest unit, licensee, and forest. For example, harvest on the Pop1 forest unit was 165% of the AHA (2,991 ha harvested versus a calculated AHA of 1,815 ha). This is identified as a "major detriment to sustainability" and, in this case, the harvest activity is broken down by former forest. This analysis effectively identified the forest units that should be managed with extra vigilance into the future.

Harvest data is presented as planned versus actual for both harvest area and harvest volume. Table 7 summarizes the harvest for the NHF by harvesting licensee or contractor.

Table 7 : Planned and actual harvest area and volume by licensee or contractor on the Nighthawk Forest between 1998 and 2003.

Licensee or contractor	Planned Harvest Area (ha)	Actual Harvest Area (ha)	Planned Harvest Volume (m^3)	Actual Harvest Volume (m^3)
Donohue Forest Products	12,880	5,099	1,144,858	450,928
Nighthawk Timber Co. Ltd.	629	534	55,698	94,005
Norbord Industries Inc.	0	514	0	77,403
Tembec Industries Inc.	0	1,634	0	134,511
Timmins Forest Products Ltd.	1,077	1,038	0	22,938
Wayne Logging and Sawmill	0	-	0	3,141
Grant Forest Products Corp.	0	674	0	113,198
Domtar Forest Products	0	2,073	0	196,769
Tom Trussler	0	28	0	487
Fuelwood	0	-	0	2,737
Other	0	-	15,577	14,322
All	14,757	11,712	1,360,109	1,110,436

Source RPFO-3, RPFO-4 1998-2003

Two items are noteworthy from Table 7. The first is that both area and volume harvested were underachieved (79% of planned area and 81% of planned volume harvested) by similar margins. The consistency is some indication that planning assumptions for the timber resource are reasonably accurate.

Second, the majority of licensees or contractors had no allocation specified in the plan, but ended up harvesting 49% of the volume. During the 1998-2003 period, all of the harvest area was allocated to the SFL holder with the knowledge that business-to-business agreements would result in a variety of operators working on the NHF.

Tables RPFO-7 and RPFO-8 address the renewal program on the NHF. The silviculture program that was conducted during the 1998-2003 period is detailed in Table RPFO-7. Total renewal treatments were 67% of that planned, covering 85% of the area harvested. Treatments included 3,869 ha of natural renewal, 5,696 ha of planted area, and 372 ha that were scarified for natural seeding treatments. The area treated for natural renewal was 60% of the target and area planted was 123% of the target. Chemical site preparation targets were achieved, although RPFO-7 indicates a considerable shortfall in chemical site preparation (only 24% of planned area was treated) and total site preparation including chemical, mechanical, and prescribed burns (36% of planned area).

Seventy-seven percent of aerial tending was carried out and manual tending occurred on 155 ha.

Overall, the RPFO reports a renewal program that is not fully supporting the harvest effort, and attributes most of this to lack of natural regeneration in hardwood forest units. The report recommends that natural regeneration be monitored in the future.

Table RPFO-8 quantifies a massive overachievement in the reporting of regeneration success. AbitibiBowater completed 85,107 ha of FTG surveys through this period, after planning to carry out surveys on 15,582 ha. Clearly, a huge effort to survey backlog areas was made. Successful regeneration to the FTG standard was reported on 81,378 ha of the area surveyed, a success rate of 96%. The report states, somewhat modestly, that “an adequate FTG survey program is in place” and that it is showing the NHF is being successfully renewed.

Table RPFO-9 attempts to relate original forest unit to future forest unit and expected date of FTG status. The ability to complete this table is constrained by the fact that older data records did not track old and new forest unit transitions. Having stated that, RPFO-8 predicts that for all but one forest unit (the MXda is predicted to move to an MXDC1 on 55% of the area for this forest unit), the future will be the same as the past. It is predicted that 98% of the remaining forest units will be declared FTG in the same forest unit as existed at time of harvest.

No silvicultural treatments that were exceptions to the forest management guidelines were noted in the RPFO.

The RPFO includes a suitable analysis of the assumptions used to support the modeling that was the basis for most of the development of strategic management direction on the NHF. For example, the report notes that large fires, such as the one that occurred on the NHF in 1997, were not included in wood supply modelling. The report notes that fire areas are included as depletions as part of the annual land base updating. It suggests that this practice be continued into the future.

The RPFO comments on the movement towards standard forest units in the 2003 FMP and suggests that new ecosite coding will help planning teams to better refine the forest units as upland and lowland sites.

The reports also comment on the low achievement of yellow birch harvest, and on the larger than predicted area set aside in reserves (13% of AHA predicted versus 23% actual) and suggests assumptions for both of these items be modified in future plans.

The results of the three independent forest audits that occurred on the Driftwood Forest, Timmins Forest, and Timmins Management Unit in 2003 were discussed in the RPFO. The RPFO includes a brief discussion of the recommendations from the audits, and includes a document that addresses each of the 23 recommendations. It is noted that the audits each conclude that the forests were being sustainably managed.

No AOC prescriptions that were exceptions are noted in the RPFO. The RPFO included a list of amendments that were implemented in each of the former forests. The number of amendments for the forest as a whole was quite low. All amendments were minor, and discussion in the RPFO concerning amendments was suitable.

3.7.2 Assessment of Objective Achievement

The independent forest audit protocol requires that a list of management objectives from the latest RPFO (1998-2003) and the 2003-2023 FMP, and an assessment of the progress that has been made towards achieving each of them, be prepared.

The 1998-2003 RPFO for the NHF lists objectives as an attachment to the report. Objectives are first grouped into one of four major objectives (forest diversity, social and economic, forest cover, and silviculture) as required by the 1996 FMPM. The RPFO then breaks each objective into sub-objectives, by originating forest.

Tables 8, 9, and 10 detail the objectives and subobjectives as reported for each forest, with comments from the auditors on achievement of the objectives.

Table 8. An assessment of achievement of the objectives and subobjectives from the former Driftwood Forest from the 1998-2003 RPFO for the Nighthawk Forest.

<table>
<tr><th>Objective</th><th>Subobjective</th><th>Auditor Comment</th></tr>
<tr><td>Forest Diversity</td><td>Maintain natural levels of biodiversity to reflect natural burn size frequency over 20 to 40 years</td><td>The RPFO includes percentage targets for 6 size classes of forest disturbances. Results are listed for the NHF. The size classes, targets, and accomplishments are as follow:
<table>
<tr><th>Opening size (ha)</th><th>Target percent</th><th>Actual percent</th></tr>
<tr><td>10-130</td><td>31</td><td>73</td></tr>
<tr><td>131-260</td><td>11</td><td>12</td></tr>
<tr><td>161-520</td><td>17</td><td>6</td></tr>
<tr><td>521-1040</td><td>16</td><td>6</td></tr>
<tr><td>1041-5000</td><td>21</td><td>5</td></tr>
<tr><td>5001-10000</td><td>3</td><td>0</td></tr>
</table>
Harvest patterns did not match the targeted size distributions. Progress was limited to actually defining the targets. The size classes were recalculated for the 2003 FMP. This subobjective was not met.</td></tr>
<tr><td></td><td>Protect all identified values by implementing guidelines</td><td>The values map was updated and guidelines were applied. Compliance records indicate that suitable effort was made to ensure values are protected. This subobjective was met.</td></tr>
<tr><td>Social and Economic</td><td>Guarantee economical long term supply of wood fibre to user mills</td><td>Supply targets were met for SF chips, Po veneer, SF sawlogs.
13,123 m³ of poplar OSB produced, just short of 15,000 m³ target.
Interviews with OSB users indicated acceptable quantities were received. This subobjective was met.</td></tr>
<tr><td></td><td>Promote optimum utilization of available wood through best end use</td><td>The documented delivery of pulp, sawlogs, veneer, OSB, firewood, cedar, larch, and white birch addresses this subobjective. This subobjective was met.</td></tr>
<tr><td></td><td>Promote even flow of wood subject to volume targets</td><td>Wood flow was driven by market demand. It was not a matter of an even flow as much as it was producing fibre when each mill needed it most. Interviews confirmed the wood was getting to mills in an acceptable manner. This subobjective was met.</td></tr>
</table>

Objective	Subobjective	Auditor Comment
	Promote full utilization secondary forest resources	There has been a demonstrated harvest and sale of cedar, larch, birch for fuelwood, personal use, and other uses. This subobjective is being met.
	Integrated resource management objective to optimize benefits and minimize conflicts for all users and follow DLUGs.	No bump-ups or unresolved issues reported in the RPFO. 14 amendments through the audit period. This subobjective was effectively met.
Forest Cover	Maintain current species composition on the forest	A target of a maximum of 25% fluctuation in harvest area between 20 year planning terms for all forest units except bamix and ppop3 was met during the FMP modelling. This subobjective was met.
	Maintain cover between disturbance patches for moose and marten	A target of separating harvest patches by 300-1,000 m of undisturbed forest and a 20-year difference in age was met, according to the RPFO. This subobjective was met.
	Maintain structural elements in harvest patch	Target of six large snags per ha was not always met on lowland sites as six large trees were not always available. Representative snags were left on site, as per compliance reports. This objective was effectively met.
	Protect critical moose habitat	Target of maintaining 30,000 ha of preferred moose habitat was exceeded (34,108 ha actual). This subobjective was met.
	Protect rare, threatened, and endangered flora and fauna	The only evidence presented is that no known RTE species were impacted. The auditors will state that the subobjective was met although the evidence is weak.
Silviculture	Implement silviculture program	Targets were met for CLAAG harvest, aerial tending, and FTG surveys. No strip cuts were completed, 446 of 946 ha were planted, 1,248 of 3,901 ha of chemical site preparation was completed, and no ground chemical tending was completed. Overall, the subobjective was met.

Table 9. An assessment of achievement of the objectives and subobjectives from the former Timmins Forest from the 1998-2003 RPFO for the Nighthawk Forest.

<table>
<tr><th>Objective</th><th>Subobjective</th><th>Auditor Comment</th></tr>
<tr><td>Forest Diversity</td><td>Maintain natural levels of biodiversity to reflect natural burn size frequency over 20 to 40 years</td><td>The RPFO includes percentage targets for 6 size classes of forest disturbances. Results are listed for the Nighthawk Forest. The size classes, targets, and accomplishments are as follow:
<table>
<tr><th>Opening size (ha)</th><th>Target percent</th><th>Actual percent</th></tr>
<tr><td>10-130</td><td>31</td><td>73</td></tr>
<tr><td>131-260</td><td>11</td><td>12</td></tr>
<tr><td>161-520</td><td>17</td><td>6</td></tr>
<tr><td>521-1040</td><td>16</td><td>6</td></tr>
<tr><td>1041-5000</td><td>21</td><td>5</td></tr>
<tr><td>5001-10000</td><td>3</td><td>0</td></tr>
</table>
Harvest patterns clearly did not match the targeted size distributions. Progress was probably limited to actually defining the targets. The size classes were re-calculated for the 2003 FMP. Analysis shows some movement towards natural range target but harvest patterns contain too many small cuts and not enough medium-to-large cuts. This subobjective was not met.</td></tr>
<tr><td></td><td>Protect all identified values by implementing guidelines</td><td>The values map was updated and guidelines were applied. Compliance records indicate that suitable effort was made to ensure values are protected. This subobjective was met.</td></tr>
<tr><td></td><td>Maintain or increase red and white pine component by implementing Old Growth Red and White Pine Conservation Strategy.</td><td>11,000 white pine were planted and a total of 7 m^3 of white pine was harvested. No red pine was harvested. This subobjective was met.</td></tr>
<tr><td>Social and Economic</td><td>Guarantee economical long term supply of wood fibre to user mills</td><td>Supply targets met for OSB, SPF logs and pulp. Shortfall of 1,121 m^3 for veneer (30%). Interviews with veneer users confirmed the supply is acceptable. This subobjective was met.</td></tr>
<tr><td></td><td>Promote optimum utilization of available wood through best end use</td><td>The documented delivery of pulp, sawlogs, veneer, OSB, firewood, cedar larch, and white birch addresses this subobjective. This subobjective was met.</td></tr>
</table>

Objective	Subobjective	Auditor Comment
	Promote even flow of wood subject to volume targets	Wood flow was driven by market demand. It was not a matter of an even flow as much as it was producing fibre when each mill needed it most. Interviews confirmed the wood is getting to mills in an acceptable manner. This subobjective was met.
	Promote full utilization secondary forest resources	Demonstrated harvest and sale of cedar, larch, and birch for fuelwood, personal use, and other uses. This subobjective was met.
	IRM objective to optimize benefits and minimize conflicts for all users and follow DLUGs.	No bump-ups or unresolved issues reported in the RPFO. 25 amendments through the audit period. This subobjective was effectively met.
Forest Cover	Maintain current species composition on the forest	A target of a maximum of 15% fluctuation in harvest area between 10-year planning terms for all forest units was met during the FMP modelling. This subobjective was met.
	Maintain cover between disturbance patches for moose and marten	A target of separating harvest patches by 300-1,000 m of undisturbed forest and a 20-year difference in age was met, according to the RPFO. This subobjective was met.
	Maintain structural elements in harvest patch	The target of six large snags per ha was not always met on lowland sites as six large trees were not always available. Representative snags were left on site, as per compliance reports. This objective was effectively met.
	Protect critical moose habitat	Target of maintaining 30,000 ha of preferred moose habitat was exceeded (53,355 ha actual) as was target of 3,000 ha of preferred moose summer habitat. This subobjective was met.
	Protect rare, threatened and endangered flora and fauna	The only evidence presented is that no known RTE species were impacted. The auditors will state that the subobjective was met although the evidence is weak.
Silviculture	Implement silviculture program	Harvest target was not met (504 ha CLAAG vs. a target of 4,062 ha) and consequently all other targets were not met. FTG surveys exceeded the target. This subobjective was not met.

Table 10. An assessment of achievement of the objectives and subobjectives from the former Timmins Management Unit Forest from the 1998-2003 RPFO for the Nighthawk Forest.

<table>
<tr><th>Objective</th><th>Subobjective</th><th>Auditor Comment</th></tr>
<tr><td>Forest Diversity</td><td>Maintain natural levels of biodiversity to reflect natural burn size frequency over 20 to 40 years</td><td>The RPFO includes percentage targets for 6 size classes of forest disturbances. Results are listed for the Nighthawk Forest. The size classes, targets, and accomplishments are as follow:
<table>
<tr><th>Opening size (ha)</th><th>Target percent</th><th>Actual percent</th></tr>
<tr><td>10-130</td><td>31</td><td>73</td></tr>
<tr><td>131-260</td><td>11</td><td>12</td></tr>
<tr><td>161-520</td><td>17</td><td>6</td></tr>
<tr><td>521-1040</td><td>16</td><td>6</td></tr>
<tr><td>1041-5000</td><td>21</td><td>5</td></tr>
<tr><td>5001-10000</td><td>3</td><td>0</td></tr>
</table>
Harvest patterns did not match the targeted size distributions. Progress was probably limited to actually defining the targets. The size classes were recalculated for the 2003 FMP. Analysis shows some movement towards natural range target but harvest patterns contain too many small cuts and not enough medium-to-large cuts. This subobjective was not met.

All landscape level spatial forest diversity indices were within 10% except for "mean nearest neighbour". This is a difficult target to meet because of a landscape fragmented by private ownership. This subobjective is not met.</td></tr>
<tr><td></td><td>Create future suitable marten core areas</td><td>Not assessable on just the Timmins Management Unit Forest. NHF core area met the target requirement. This subobjective was met.</td></tr>
<tr><td></td><td>Improve forest fragmentation measurements</td><td>Objective was met through planning. A post-harvest measurement did not specifically occur. The subobjective was met.</td></tr>
<tr><td></td><td>Maintain present fisher on</td><td>Preferred fisher habitat was 10,380 ha</td></tr>
</table>

Objective	Subobjective	Auditor Comment
	forest	in 2001 and projected to increase to 11,010 ha in 2012. This subobjective is being met.
	Utilize HARP on all aged SB1 and LC1	HARP was not planned or reported. The subobjective was not met.
	Maintain mature and overmature proportion by forest unit	This subobjective was met through a SFMM constraint in planning.
	Protect rare, threatened and endangered flora and fauna	The only evidence presented is that no known RTE species were impacted. The auditors will state that the subobjective was met although the evidence is weak.
	Collect and use seed from Timmins Management Unit seed zone	Only seed from seed zone #24 was utilized. This subobjective was met.
	Use Sb and Pj improved seed from Ramore seed orchard	Available improved stock was used. This subobjective was met.
	Use nutrient-loaded planting stock	This subobjective was not met.
Social and Economic	Continuous and predictable wood supply to local mills	Supply targets shortfall for OSB poplar and white birch, and marginal shortfall for poplar veneer. SPF logs and pulp target was met. This subobjective was partially met.
	Promote optimum utilization of available wood through best end use	The documented delivery of pulp, sawlogs, veneer, OSB, firewood, cedar, larch, and white birch addresses this subobjective. This subobjective was met.
	underutilized species utilization	Demonstrated harvest and sale of cedar, larch, birch for fuelwood, personal use, and other uses. This subobjective was met.
	Optimize benefits and minimize conflicts for all users and follow DLUGs.	No bump-ups or unresolved issues reported in the RPFO. No amendments were made through the audit period. This subobjective was effectively met.
Forest Cover	Harvest patch separation to emulate natural disturbance	All harvest blocks were planned to meet separation targets of 200 m minimum. This subobjective was met.
	Emulate natural disturbance residual patches	Actual residual proportions will be measured after the completion of the 2003-08 harvest. This subobjective has been addressed, but it is not possible to confirm at this time.

Objective	Subobjective	Auditor Comment
	Emulate natural disturbance edge	To be measured as part of the 2003 NHF assessment of landscape. This subobjective has been addressed , but it is not possible to confirm at this time.
	Maintain snag and coarse woody debris	Snag requirements have been met as monitored by the compliance program. This subobjective was met.
	Maintain or enhance marten habitat	One marten core was created but it was only 539 ha. The subobjective was not met.
	Maintain or enhance moose habitat	The target of 6,276 ha of moose habitat was exceeded. The moose guidelines have been applied. The subobjective was met.
	Maintain water quality and fish habitat	Slope-based timber reserves and riparian reserves were applied according to guidelines. The subobjective was met.
Silviculture	Support harvest, achieve future desired forest condition efficient use finances.	Harvest and FTG survey targets were met but targets for seeding, site preparation, and planting were not. This subobjective was not met.

The RPFO added substantial depth to the tabled summary of objectives by providing a useful analysis on each of the RPFO tables that directly address the measurable indicators of the five sustainability criteria listed in the 1996 FMPM. This is discussed in Section 3.7.3 of this report.

The 2003-2023 FMP has the same four major objectives plus Integrated Resource Management, which have been subdivided into a series of 21 subobjectives and a further 9 subobjectives. These are listed in Table 11, along with an abbreviated description and comments from the auditors on achievement of the objectives.

Table 11. An assessment of achievement of the objectives and subobjectives from the 2003-2023 FMP for the Nighthawk Forest.

Objective	Subobjective		Auditor Comment
Forest Diversity Objectives - To maintain a forest that through time has all the attributes of a natural fire driven boreal forest ecosystem both at the stand and landscape level as much as possible given artificial management interventions. The analysis of the historical condition will represent a benchmark for the natural fire driven boreal forest. -To develop a long term harvesting pattern on the Nighthawk Forest that resembles a natural fire pattern as closely as possible			
	Forest Unit area Objective	To maintain forest ecosystems, described in terms of forest units, similar to ranges that would occur in a natural fire driven boreal forest, based on the historical condition.	The objective includes detailed targets for forest unit area and forest unit group proportions. The forest unit area target to maintain forest unit areas within the bounds of natural variation, plus or minus 20%. Each forest unit target was based on the null scenario SFMM run. AbitibiBowater has monitored the movement of forest units towards the target over the

Objective	Subobjective		Auditor Comment
			audit period, and refined the planning target in the 2008 FMP. Silvicultural strategies have been defined and implemented for each forest unit. This is a long term objective. Progress towards successful implementation is evident. The forest unit group targets are well defined in the FMP. This will be monitored over successive plans. Silviculture strategies are in place to manage these areas, and monitoring is in place to confirm progress. Progress towards implementation is evident.
	Forest Age structure objective	To maintain a balanced age class structure by maintaining a proportion of the forest units groups within mature and over mature age classes, and allowing for a sustainable harvest of these age classes. The relative proportions within these age classes will ideally be similar to the ranges that would occur under natural post fire conditions in the boreal forest according to the analysis of the historical condition.	The Company has created percentage age class targets for each forest unit group (Figure 3.4.2, 2003 FMP). The figure defines the maturity ages for mature and overmature age classes. These were entered as a constraint for all SFMM runs and no management alternatives were considered to be acceptable if these targets were not met. There is ample evidence that AbitibiBowater monitors the age class of each forest unit carefully (e.g.,FMP2, FMP4), and that the FRI is updated to track changes in age class due to harvest or detectable natural disturbance. AbitibiBowater has the silvicultural strategies in place to enhance of maintain each forest unit. Progress towards implementation is evident.
	Landscape Diversity objectives	Monitor the spatial landscape diversity indices for the Nighthawk Forest using SFMM and the	AbitibiBowater has defined targets and strategies for monitoring the landscape diversity indices. This is

Objective	Subobjective		Auditor Comment
		Landscape Ecological Analysis Package II. - Improve landscape health on the forest	updated on five-year increments, as per the 1996 FMPM and will be done on 10-year measures as per the 2004 FMPM. There is ample evidence that this monitoring is taking place, therefore the objective is being met. Evidence to support an objective of improving landscape health on the forest is about as diffuse as the objective is itself. The auditors are unable to assess progress on this portion of the objective.
	Landscape and Stand Level Disturbance Objective	To maintain the forest spatial structure by emulating natural patterns of disturbance in terms of patch size, patch separation, patch shape, patch edge to area ratio, patch structural elements and patch residuals at both the landscape and stand levels.	As was the case with the RPFO, targeted disturbance patches have been defined. Harvest disturbances still under represent all but the 10-130 ha class size. Large fires during the last term provide some large (2,001-5,000 ha) disturbances, but no larger areas are on the land base, nor are any expected unless they are created by wildfire. AbitibiBowater is progressing at implementing these patch size targets within the constraints of other values.
	- Disturbance Patch Size subobjective	The size frequency and proportion of area for the selected harvest blocks within the Nighthawk Forest will reflect the size frequency and proportion of area naturally occurring fires.	Targeted disturbance patches have been defined. Harvest disturbances still under represent all but the 10-130 ha class size. Large fires during the last term provide some large (2,001-5,000 ha) disturbances, but no larger areas are on the land base, nor are any expected unless they are created by wildfire. AbitibiBowater is progressing at implementing these patch size targets within the constraints of

Objective	Subobjective		Auditor Comment
			other values.
	- Disturbance patch shape Subobjective	To emulate, through harvest block configurations, the shape and orientation of natural fires as much as possible on the NHF given the limitations of landforms, access and the distribution of operable timber and operational constraints.	Target shapes and orientation have been defined. A review of the maps and photos of sites inspected on the audit confirm that blocks are generally oblong, tend to be oriented on a southwest to northeast axis, with irregular edges that follow previous stand boundaries. This subobjective has been met.
	Structural Elements within Disturbance Patch Subobjective	Provide structural elements after harvesting including standing dead or declining trees and fallen coarse woody debris within a disturbance patch, that represent those of typical tree species from the original stand	Targets include leaving 25 trees per ha, with at least 6 large live trees, with residual coarse woody debris. Direct observations of 55 sites during the field audit confirmed conformance to these targets. This was supplemented by a review of compliance reports which confirmed observations. This objective has been met.
	• *Residual Forest retained within Disturbance Patch Subobjective*	Ensure that the past 15-year and future five-year disturbance patches contain residual patches within them that mimic the unburned patches within a fire as much as possible.	The auditors did not observe harvest sites prior to the audit period. All sites inspected on the audit met the stated residual forest targets (islands and peninsulas) of this subobjective. This has been effectively implemented over the last five years, and with the condition that the sample only includes the last five years of the 15 years referenced in the objective, the subobjective has been met.
	Wildlife Habitat Units Objectives	Ensure individual wildlife habitat units presently found on both sub-units of the NHF will be maintained or enhanced in terms of relative abundance and functionality.	Targets for wildlife habitats state that habitat supply must remain within 20% of the bounds of natural variation. This has been entered as a constraint on SFMM, and has been met in the selected management alternative. This objective has been met.

Objective	Subobjective		Auditor Comment
Social and Economic Objectives - To maintain and where feasible enhance the social economic recreational and cultural benefits available from the nighthawk Forest			
	Timber Supply Objectives	- To provide a continuous and predictable supply of wood to the user mills dependent on the NHF according to the long term (100 years) wood supply targets, while still meeting forest diversity targets. - Promote optimal utilization of available wood products through best use in order to contribute the greatest value added to the local economy for each cubic metre of wood - Promote the fullest and most efficient utilization of secondary forest resources (e.g. low quality wood and marginally commercial species) in order to maximize the yield of forest products from each hectare of land being harvested.	The timber supply modelling required for FMP meet the requirements of this objective. Timber supply calculations provide a detailed forecast of timber volumes predicted to be available over the 100 year time horizon. These are re-run every five years as part of the 1996 FMPM requirements. The audit team reviewed the assumptions supporting the SFMM run that produced the selected management alternative and found them credible. The actual volumes received over the last term have been limited by reduced mill demand. This subobjective has been effectively met.

Objective	Subobjective		Auditor Comment
	Tourism & Recreation Objectives		
	- *Commercial Tourism Subobjective*	Maintain and suitable and sustainable environment for the tourism industry by minimizing and mitigating the impacts of forest management operations as much as possible	No targets have been identified for this objective. AbitibiBowater has been meeting planning requirements to include tourism considerations, and, in spite of having no targets, have a developed strategy which effectively outlines operating principles that help to support this objective. The audit team received no negative comment from tourist operators on the forest. The objective has been met.
	- *Other Forest Resource Subobjective*	Minimize the residual effects of forest industry access on other forest resources.	This objective appears to be a place holder to document rehabilitation of tertiary road and removal of water crossings. Whether these activities have taken place to minimize effects on other users or to limit future liabilities for AbitibiBowater and OMNR, AbitibiBowater has a defined program in place to remove water crossings as the audit team witnessed some road rehabilitation.
	- *Land and Water Based Recreation Subobjective*	Maintain a suitable environment for recreation use of the forest.	No targets are identified and strategies defined to meet the objective largely revolve around application of current AOC prescriptions. This is a sensible response to this objective, and functionally meets the stated intent of it.
	- *Trapping Subobjective*	To minimize impacts of mature forest removal on registered trap lines in the NHF	AbitibiBowater and OMNR are actively monitoring potential impacts of harvest operations on registered traplines. The strategy for doing this is well developed, and based on interviews with staff of both agencies, is implemented effectively.

Objective	Subobjective		Auditor Comment
	- *Other Commercial Activities subobjective*	Minimize negative impacts of forest management on other commercial forest activities on the NHF such as trapping , mineral exploration commercial berry picking etc.	AOCs have been applied when other commercial concerns have been identified. Interviews with LCC, a review of the FMP correspondence file, and other consultation efforts did not indicate any unresolved issues here. This objective appears to be met.
	Cultural Heritage Objectives	To protect cultural heritage values that may be affected by Forest management	The Cultural Heritage Guidelines have been applied and suitable AOCs have been used. This objective has been met.
	First Nations Objectives	• Protect natural resource features, land uses and values which are specifically pursued by, or of importance to, local First Nation communities that may be affected by forest management operations • Provide First Nation economic development opportunities where feasible	This is the subject of ongoing consultation with First Nation communities with an interest in the NHF. AbitibiBowater appears to react effectively to identified First Nation values.
	Provincial Parks Objectives	Ensure that due consideration is given to the management plan, goals, objectives, and concerns of provincial parks in the course or developing the FMP for the NHF. Also consider values identified in OLL areas.	Parks and OLL areas are identified on operational maps and suitable AOCs have been applied when working near them. This objective has been met.
Forest Cover Objectives	Wildlife Habitat Objectives	Maintain an adequate supply of habitat for all indigenous wildlife species on both subunits	The FMP projects to maintain the wildlife habitat for 23 selected species above the natural lower boundary. The selected management alternative does this. The plan meets the stated target. Performance in the future

Objective	Subobjective		Auditor Comment
			will confirm if the objective is met but the audit team has no reason to doubt it.
	Marten Habitat Objective	• Ensure all aspects of the marten habitat requirements are maintained or enhanced on the NHF through the *Implementation of the Forest Management Guidelines for the Provision of Marten Habitat.* (1996) • To maintain suitable marten habitat on the NHF	The effort made to accommodate this objective is comprehensive. The *Implementation of the Forest Management Guidelines for the Provision of Marten Habitat* has been applied conscientiously. Core areas into the future (60 years) are identified and plans have been made to link them through the use of riparian areas, parks, and OLL lands. The objective is clearly ongoing, but AbitibiBowater has met the initial requirements to demonstrate conformance.
	Moose Habitat Objectives	• Maintain or enhance moose wintering and foraging habitat on the NHF over the long term. Protect critical moose habitat on the NHF. • Improve moose habitat in high potential areas of the NHF.	The moose habitat target was exceeded on all parts of the forest during the previous FMP. The targets are clearly identified for the forest as a whole, and have been met through this audit term.
	Rare Flora, Fauna and Ecosystem Objectives	To maintain, protect or enhance where needed, critical habitat for vulnerable, threatened and endangered species on the NHF.	No targets have been established, although the OMNR and AbitibiBowater will be required to revise their approach to RTE species and habitat management. It is expected that evidence to support this objective will be enhanced by survey efforts to identify RTE species in the future term. The objective has been passively met to date.
	Water Quality and Fish Habitat Objectives	Ensure the protection and maintenance of water quality and fish habitat where forest management	Suitable AOCs have been applied when working around water. Road rehabilitation and water

Objective	Subobjective		Auditor Comment
		activities occur.	crossing removal efforts also support this objective. It has been met.
Silviculture Objectives		Provide a healthy, productive and sustainable forest ecosystem at the management unit level.	
	Application of Silviculture Program Objective	Manage the forest in a manner that is consistent with maintaining and improving the productivity, health, vigour and quality of the forest at a sustainable level while maximizing the efficient use of finite financial resources and lead the forest to the desired future forest condition.	The silvicultural program has refined the use of artificial renewal treatments by targeting planting sites more specifically. This has resulted in a planned and documented shift to more natural renewal. The audit team witnessed a successful natural renewal program and is convinced that this shift will meet the stated objectives effectively. It is noted that ultimate evaluation of this shift will not be possible until FTG assessments of the natural sites have been completed.
	Quality of Timber Objective	Improve the quality of timber over time to provide the optimum level of desired wood products to mills dependent on the NHF.	Forest renewal revenues have been sufficient to meet one of the initial targets for this objective. There has been a shift to a greater proportion on natural renewal over the past five years. FTG performance will need to be monitored carefully to ensure yield expectations as defined in the SFMM are met. The audit team did not witness any renewal failures in site visits. The objective is currently being met.
	Productive Forest Area and Forest Productivity Objective	• Maintain the area of the productive forest on the NHF as close to or above the current condition of 298,890 ha. • Minimize the loss of productive land to roads, landings	SFMM projections indicate this objective will be met over the 100 year time horizon. The defined target is currently exceeded. Targets to reduce areas designated as Barren-and-scattered have been met. The objective is being met.

Objective	Subobjective		Auditor Comment
		slash pile and aggregate extraction.	
	Fire Processes Objectives	Recognize fire as an integral component of the ecological processes occurring within the boreal forest and utilize fire, when feasible, to help maintain the sustainability of the forest	The objective includes a modest target of salvage and slash pile burning. There is no operational burning used as a silvicultural tool, largely due to OMNR regulations. The targets have been met, but due to constraint, fire has not been used as a planned silvicultural activity. The objective has been met.
	Tree Genetics and Seedling Quality Objectives	Ensure preservation of the local, gene pool	AbitibiBowater has sufficient local seed to support its artificial regeneration efforts through the next five-year period. Natural regeneration, by definition uses local, natural seed. The objective is being met.
	White Pine and Red Pine Objectives	• To maintain or increase the area occupied by the white pine and red pine forest unit across the NHF. • To work towards restoring the area occupied by white pine and red pine to historical levels.	The efforts to protect and increase red and white pine are strong. The auditors witnessed several plantings that included a white or red pine component. The strategy in place to increase incidental pine on the forest is well implemented. This objective is being met.
Integrated Resource Management Objectives	Co-ordinate forest management such that benefits to all users can be optimised while conflicts resulting from forest operations are minimized consistent with the Timmins District Land Use Guidelines, Kirkland Lake District Land Use Guidelines, and Cochrane District	No subobjectives listed	This is a vague objective. It is not possible to successfully meet the requirement to “optimize”” user benefits or minimize conflicts. However, interviews with the LCC were largely positive. There were two bump-ups on the 2008 FMP and none on the previous plan. The auditors did not find notable exceptions to DLUGs in the FMP. The audit team assumes that optimizing benefit to all users is not an absolute measure. Given the small

Objective	Subobjective	[illegible]	Auditor Comment
	Land Use Guidelines.		number of stakeholders that have initiated a bump-up, this objective is deemed to have been addressed.

3.7.3 RPFO Determination of Forest Sustainability

The analysis of the current and future forest condition notes an eight percent reduction of the Crown forest available for management, due entirely to the creation of Ontario Living Legacy parks or protected areas. The 2008 FMP shows an increase in this indicator of almost 20,000 ha, as the results of a review of patent land were completed. The Crown land projected to be available for timber production in the future is 300,158 ha in 2023, and 299,835 ha in 2103.

The area listed as barren-and-scattered decreased from 34,846 ha in 1998 to only 3,798 ha in 2003 due to an aggressive program to conduct FTG surveys. This is a significant improvement in the recorded area available for timber production. AbitibiBowater is commended for the massive effort involved in bringing this land back into productive area.

Landscape pattern indices are identified as a baseline measure. These had not been measured previously and the information reported in Table RPFO-15 will serve as a benchmark for future comparisons.

A useful review of other indicators is provided in the RPFO. The subobjectives presented above show the forest is missing its target on having harvest blocks sizes match those openings calculated to mimic natural variation. In the early days of this indictor, it is significant progress that the measurement data is compiled. This will serve as an essential platform for future comparisons.

The other subobjectives that have not been met tend to follow harvest. Reduced harvest results in a reduced demand for silviculture. It is significant that interviews with mill representatives did not indicate dissatisfaction with the volume of wood they were receiving from the NHF. The auditors interpret that to mean that while there was not as much harvest, or as much silviculture performed as planned, the effort made met industrial requirements.

As noted in section 3.7.2, the assessment of sustainability in the RPFO provides a useful comment on progress made in applying strategies and establishing measurable indicators and programs to monitor the indicators of sustainability over time. The strongest benefit of the RPFO is clearly in establishing a baseline from which to measure these indicators in the future. The RPFO combined data from three previous forests, each with slightly different forest units. It documented specific forest unit targets, as well as targets for each of its other indicators that largely are based on the forest unit definition. In short, the assessment of sustainability in the RPFO clearly marks the start of the 2003 FMP as the beginning of objective measurement into the future.

The audit team findings support the comments in the report. The confusion created by merging three forests has largely been resolved. The documents viewed as part of this audit, including the 2003 and 2008 FMP planning documents, the annual reports, and compliance operational documents, supported observations made in the RPFO. Similarly, field observations upheld RPFO statements, particularly with respect to FTG efforts.

3.7.4 Comparison and Trends Analysis of Planned vs. Actual Forest Operations

As part of the requirements for the independent forest audit process, AbitibiBowater has collated information from the current and previous two planning periods (1993-1998, 1998-2003, and 2003-2008 inclusive) for the NHF and the three forests that were combined to form the NHF. The Trends Analysis is attached in its entirety as Appendix A to this report. The 15-year perspective provides trend information on forest sustainability. The Trend Analysis report submitted by AbitibiBowater was received in good order and provided reasons and rationale for the trends. The auditors used this report and the annual reports produced during the audit term to analyze sustainability.

The auditors found no inaccuracies in the information presented in the Trends Analysis and the source documents, annual reports, RPFOs, and FMPs they reviewed.

The Trends Analysis notes that economic factors beyond the control of AbitibiBowater towards the end of the audit period were a significant influence on the achievement of FMP objectives and targets. The result has been decreased harvest and coincident decreased levels of renewal.

Changes in forest composition were subtle. The total area of productive forest land increased from 336,445 ha in the 1993-1998 term to 344,007 ha in 2003-2008. This is largely attributed to a significant and successful effort to conduct FTG surveys. Forested areas classified as barren-and-scattered/not sufficiently restocked or below regeneration standards were reduced from 57,345 ha in 1998 to 8,488 ha in 2003. Other factors that led to the increase in productive forest land included improved accuracy of the FRI, improved identification and definition of Crown land boundaries, and a reduction of errors in land categorization. The increase in total area of productive forest land was countered by an addition of 34,410 ha of recently depleted areas (through harvest or natural disturbance).

White and red pine areas, which are at their most northern range in the south part of the Timmins District, declined by 3 ha from 1993, although it increased by 24 ha from 2003. This is a very small forest unit, currently at 115 ha. There is an objective to double the current area of white pine and red pine over the next 100 years.

Jack pine area remained constant while there was an 8% increase in the area of spruce as a result of natural spruce regeneration and conversion of backlog balsam fir areas.

Balsam fir area decreased by about 30% over the period assessed, since much of this area was planted to spruce. It is important to note that virtually all of the balsam areas were infested by spruce budworm in the late 1970s and 80s and, subsequently, there was an objective in the first planning period to convert from balsam fir to the less susceptible spruce. The dramatic decrease in balsam fir from the first to second planning periods is the result. Conversion of balsam sites to other conifer species was considered an extreme option and used if there was a potential for a very high yield from other species. This practice was discontinued, which explains the increase in balsam fir in the third planning period.

The area of both poplar and white birch showed increases of 28% and 30%, respectively. This was because of increased FTG surveys along with a decrease in chemical tending to control hardwood. Many poplar and poplar mixedwood stands were harvested to meet increased hardwood demand by Grant Forest Products. The soft maple area increased while the other hardwood areas decreased. This change is mostly as a result of revisions in FRI classification and allowing the areas to regenerate naturally.

Forest units describe how forest stands are categorized for management purposes. As noted in Section 3.7.1, the forest units used in the 2003 FMP were a product of three different forests, and, as noted in the Trend Analysis, three different definitions of a forest unit. Consequently, it has been challenging to describe the forest consistently through this period. Table 2 of the Trend Analysis summarizes the migration of forest units over the three terms and from the three forests. Forest units have now stabilized with a consistent regional list of 16 forest units that will be common across all forests in the Northeast Region into the foreseeable future.

Planned versus actual harvest volumes are detailed for each of the three planning terms in Table 3 of the Trend Analysis. Planned harvest volume increased from 234,497 m^3/yr in the 1993-1998 term to 324,321 m^3/yr in 2003-2008. Harvested volume was 91% of that planned for the 1993-1998 term, 91% in the 1998-2003 term, and only 71% for the 2003-2008 term. It is notable that the actual harvest between the three terms varied by less than 10% and the volume harvested in the first and third terms varied by less than 1%.

Economic conditions were clearly challenging, but it did not affect all species equally. Spruce and jack pine volume harvest dropped by less than 4% and 1%, respectively, over the three terms, while poplar harvest declined by 36% over the same period. The Trend Analysis and the annual reports document inconsistent poplar markets and low quality timber as the main factors in the reduced harvest.

The area harvested on the NHF has been less than planned for each of the three planning periods since 1993, declining by 17% from 1993 to 2008. The decline in planned harvest area is attributed to a focus on volume harvest for conifer species, a temporary area removal from the harvest allocation to accommodate marten core areas, and a reduction in harvest areas due to the application of the Natural Disturbance Pattern Emulation Guide.

The actual area depletions were 8% lower than planned in the first term (which had significant natural depletions), 31% lower in the second term (which had no natural depletions), and 31% in the third term (only 2% less than planned when natural depletions were included).

The Trend Analysis shows, as might be expected, that forest regeneration was closely related to harvest activity. Ideally, every hectare harvested should be followed by a documented effort to regenerate that area. Table 6 of the Trend Analysis shows the total area regenerated was 28,862 ha during the 1993-1998 planning period, 7,511 ha during the 1998-2003 term, and 6,051 ha during the third term. Broad trends over the three planning periods show that actual planting has remained relatively constant but there has been a decrease in the use of strip cutting, seed tree cuts, and aerial chemical tending. The large spike in the 1993-1998 planning period is attributed to FTG surveys of naturally regenerated back log areas.

The IFA protocol requires the Company to determine how much area has been successfully regenerated following a ten-year delay from depletion. Consequently, the harvest operations from 1993-1998 have been assessed. On the NHF, areas are normally assessed for FTG as follows:

- Jack Pine – 5 years for planted, 10 years for natural
- Spruce – 6-8 years for planted, 10-12 years for natural
- Poplar – 5 years for natural
- White Birch – 7 years for natural

AbitibiBowater surveyed 90% of the area harvested and found 100% had been declared successfully regenerated. The auditors have noted earlier that AbitibiBowater has, in the past, only included successfully regenerated areas in survey results. The Trend Analysis states that a total of 1,195 ha were not surveyed including roads, landings, areas not ready for survey because they do not yet meet the FTG standards, or areas that have yet to be surveyed. Areas do not get recorded as natural regeneration until AbitibiBowater is certain the site will not need further treatments to reach FTG.

3.7.5 Conclusions Regarding Sustainability of the Crown Forest

The 1998-2003 RPFO offers the following general conclusions:

- Increasing harvest relative to the AHA and utilizing more secondary species could improve socio-economic benefits
- Over-utilization of a specific species needs to be avoided
- The bypass area (4,512 ha) represents 39% of the harvest area. Some of this is explained by the inability of one overlapping licensee to procure suitable resources to harvest sensitive sites. However 29% of the AHA was bypassed because the area did not contain merchantable timber.
- Reserves were underestimated and forecasts need to be improved
- Yield estimates need to be carefully monitored to improve accuracy over time
- Natural renewal efforts need to be increased by 15% to match harvest levels
- Natural regeneration results should be monitored closely as part of the silvicultural effectiveness monitoring program

The RPFO summarizes: "Overall, the RPFO assessments of the indicators of sustainability indicate that the current forest management operations of the NHF are sustainable and objectives are being achieved, however there are a few opportunities for improvement. Review of the model assumptions indicated possible refinements to yields, reserve and by pass assumptions may be appropriate. The OMNR compliance monitoring programs revealed no significant problems but there is room for improvement."

The audit team supports these conclusions. The RPFO did a thorough assessment of sustainability and met all requirements of the 1996 FMPM.

This audit, as directed by the *Independent Forest Audit Process and Protocol*, puts great weight on the assessment of the planning and performance of activities relating to timber extraction and how it influences the environment. The audit team has concluded that these activities are being conducted as planned, and the forest environment is responding as predicted. Timber extraction is completed in a manner that supports the sustainability of the environment on the NHF.

The auditors have made 13 recommendations. It is noteworthy that ten of these recommendations look to improve performance of the OMNR or AbitibiBowater in matters of process or procedure. Ontario has a complicated forest planning and reporting process and it is important, as a matter of public confidence and accountability, that forest managers follow it as closely as possible. However, it is also worth stating that the audit team does not believe these procedural recommendations individually, or collectively, have detectable impacts on the ecological sustainability of the NHF.

Given the higher weighting by the audit team of field observations in the conduct of this audit, the four operational recommendations have a greater bearing on the assessment of sustainability of the NHF. Each of the four recommendations constitutes relatively minor findings of operational weakness on the part of AbitibiBowater.

The most significant recommendation relates to the maintenance of water crossings on the NHF. The audit team encountered water crossings that required maintenance. These were crossings on active roads, and AbitibiBowater and OMNR had no record of the problem that was presented to the audit team. It is inappropriate to overstate the problem. Five water crossings that were substandard were encountered, and many more crossings were viewed that were excellent. However, in each case the substandard crossing could have resulted in a degradation of aquatic habitat or a challenge to public safety.

The audit team was concerned that AbitibiBowater missed an opportunity to manage an unprecedented forest tent caterpillar outbreak and, consequently, have some 13,000 ha of degraded hardwood sites to manage. The silvicultural challenge now is significant, as the sites viewed by the audit team were productive, and have very heavy competition and very little future forest. These will be very difficult to reclaim as productive forest land.

The audit team is concerned that AbitibiBowater will be equally unprepared to manage the next forest tent caterpillar outbreak. A poplar decline strategy is being prepared in support of the 2010 FMP. In addition to pursuing salvage harvesting, increased monitoring, renewal efforts, and managing the loss of volume, the audit team feels it would be beneficial if the strategy included the least expensive and most cost effective alternative, which is treating forest tent caterpillar outbreak with a biological insecticide. A thorough plan for future outbreaks, which are virtually certain with this particular insect, is required.

The other operational recommendations speak to minor improvements. Harvest practices need to match SGRs. In some situations they did not, although there were not situations where the audit team thought the harvest operation was inappropriate.

The auditors conclude that the Crown forest is being managed sustainably. Timber supply is carefully planned. It should be a predictable resource available for economic development in the area for the foreseeable future. Forest wildlife, as defined by the habitat they require, are planned for with increasing rigor. There is a current systemic weakness in how Ontario has responded to species at risk in the forest, but the audit team is convinced the managers of the NHF are operating at least at the level of the normal operator, and it is expected that improvements will be implemented over the next five years as a matter of Government policy.

Roads on this forest are generally well established and, with the exception of the recommendation for improvements on water crossings, well maintained. The audit team believes AbitibiBowater is doing an acceptable job of managing an ongoing challenge of removing roads to recapture ecological values and maintaining roads to satisfy economic and recreation values. The audit team concludes that planned roads on this forest are located in a manner that reduces their impacts on the forest environment to an acceptable level.

Harvest operations had little visible impact on soil. Rutting, which might be expected in some parts of the NHF, was noted on only three site visit forms. This is commendable since auditors normally bias their site inspections towards low-lying areas likely to have sensitive soils. A review of the operating procedures of AbitibiBowater confirmed that contractors receive clear direction on acceptable limits for site disturbance.

The impacts of harvesting on water quality were assessed at both water crossings and on harvest sites adjacent to aquatic habitat. Comments on water crossings are noted above. Operations adjacent to aquatic habitats were consistently within practice standards established for operations in riparian zones. The audit team walked through the riparian vegetation to the high water mark on eight sites to assess the integrity of the protection provided to the riparian zones. In all cases, the streams were left with sufficient vegetation to mitigate potential erosion from harvest sites and to provide shade to the streams to diminish changes in water temperature.

The recovery of vegetation following timber harvest is well documented through normal operational records. The forest types harvested on the NHF have evolved through a history of natural disturbances and are naturally resilient. The audit team and the RPFO have raised a concern that natural regeneration be monitored. Having stated that, the auditors viewed few sites where the regenerating forest was not growing back as predicted, with the notable exception of poplar sites depleted by the forest tent caterpillar.

In summary, the ecological components of the NHF, which are most likely to be influenced by forest operations, are being managed in a sustainable manner. The audit team is confident that the NHF, if managed as currently planned, will be maintained for the benefit of future generations as proclaimed in the CFSA.

The CFSA also speaks to sustainable social and economic benefits from the forest. The premise of the audit team is that if the structural integrity of the forest is sustained, the opportunity for social benefit will be maintained as well. Discussions during the audit with First Nation peoples, recreationists, and others clearly indicated that the NHF is most commonly used for reasons other than timber extraction.

The NHF is managed sustainably and in a manner that will ensure ecological sustainability over the foreseeable future. The NHF will remain a base from which social, environmental, and economic benefits can be generated into the foreseeable future.

3.8 Contractual Obligations

3.8.1 Sustainable Forest Licence

The NHF is currently managed under the terms of SFL #551047, which was approved February 4, 2004 and amended September 24, 2008. AbitibiBowater has a number of contractual obligations that must be fulfilled. This section reviews their success in meeting those obligations.

The SFL holder is required to pay Crown dues and contribute to the Forestry Futures Fund and the Forest Renewal Trust Fund for each cubic metre of wood that is harvested. AbitibiBowater has met the required payments to each of these funds. For the Crown dues and Forestry Futures Fund, payments were tied to harvest volumes. Payments to the Forest Renewal Trust Fund are also tied to harvest volumes, but carry a requirement to ensure a minimum balance of $2.5 million, which is verified on April 1 of each year. This requirement was met each year. The total in the Forest Renewal Trust Fund declined from $5.530 million dollars in 2004 to $2.531 million in 2008. This decline reflects both a reduction in revenue, as harvest declined over the term of the audit, as well as a requirement to complete silviculture from previous years when harvest, and consequently area requiring renewal, was higher.

Additionally, the Company is required to review renewal rates during the period of the audit. Evidence reviewed confirmed this had been done.

Wood supply commitments in Appendix E of the SFL included commitments to Grant Forest Products, Norbord Industries Inc., and Little John Enterprises Ltd. Interviews with commitment holders confirmed that, although they had not received their full commitment, they had received as much as they could utilize in the poor markets that dominated this five-year term.

The SFL requires AbitibiBowater to meet the requirements of the respective FMPMs in terms of the FMP, AWS, and Annual Report preparation and submission. This has been addressed in Sections 3.3 and 3.6.5 of this report. The audit team found general conformance with the requirements of the FMPM, although recommendations were made to improve performance in some areas.

Wasteful practises were addressed in Section 3.6.1 and 3.6.2 of this report. While the audit team found AbitibiBowater dealt in a timely manner with reports identifying non-compliance, recommendations have identified that OMNR performance in responding to these reports, and the performance of both AbitibiBowater and OMNR in submitting reports with no compliance problems, needed improvement.

The SFL and OMNR collectively responded to an extensive forest tent caterpillar infestation in a manner that resulted in extensive mortality to the productive poplar forest stands. This audit has recommended that these areas be renewed expeditiously.

The 2003 independent forest audits of the Driftwood Forest, Timmins Forest, and Timmins Management Unit were conducted and included 15, 10, and 5 recommendations, respectively. The audit team reviewed the summary of the Status Report on Actions Taken to address the recommendations, along with the approved action plans for each forest that were submitted by AbitibiBowater and approved by OMNR in March, 2005. These were included in a consolidated report. In general, the audit team was convinced that strong efforts were made to address each the recommendations in a thorough and effective manner. The respondents broke each recommendation into a set of actions items. The status report confirms that 17 action items are considered complete, 14 are ongoing, and three have not been completed.

The independent forest audit for the Driftwood Forest required OMNR to address six recommendations that were each procedural in nature. For example, OMNR was required to keep records of required public notices, maintain the socio-economic profiles, and ensure that survey resources are used effectively to update values information in a timely manner. Independent forest audit status reports and the Term and Condition 77 reports were required to be completed on time. These items have been effectively addressed by OMNR.

AbitibiBowater was required to improve the clarity of harvest selection criteria and explain charges and assumptions used to forecast expenditures, as required in the FMPM. It was also required to ensure field assessments had the capacity to record non-timber values. The actions taken to address these items were suitable.

The independent forest audit of the Timmins Forest required OMNR to improve its information management processes. For example, the audit required field survey data to be uniformly recorded and the amendment approval process to meet specific timelines.

AbitibiBowater was required to improve its reporting performance with annual reports meeting FMPM requirements. As well, they were also required to develop strategies to conserve, utilize, and renew incidental Great Lakes-St. Lawrence species on the NHF. Each of these items has been addressed.

OMNR and AbitibiBowater were required to develop utilization and marketing strategies for hardwood and cedars in the Northeast Region. This action has not been completed, although it is clear that significant progress has been made. Poplar has not been completely marketed while there are plans or commitments in place for cedar and yellow birch.

The Timmins Management Unit included recommendations that could be largely categorized as transitional in nature. These have been functionally absorbed into the 2008 FMP for the NHF.

The one recommendation common to all of the audits, that the Minister of Natural Resources extend the term of the SFL for the NHF, was not completed as of the end of the five year term. Given that the license needed to transfer from Abitibi Consolidated Inc. to a new SFL issued to AbitibiBowater, the recommendation for the extension was redundant.

AbitibiBowater's performance in meeting its obligations related to observing the provisions of the SGRs is covered under Sections 3.6.3 of this report. The findings of the audit team confirm that AbitibiBowater has met its obligations with respect to this matter.

AbitibiBowater's performance in meeting its obligations related to the assessment of harvested areas is discussed under Section 3.4.3 of this report. AbitibiBowater has met its license obligations in this regard.

As noted in section 3.2.5 of this report, the interest of the First Nations in the NHF was secondary for each of the five First Nations interviewed. First Nation input to the 2008 audit team was excellent. It is expected that First Nation participation will increase in the future.

AbitibiBowater has met its contractual obligations in a highly effective manner. The audit team found that AbitibiBowater's operating relationships with OMNR, three LCCs, licensees, mills, tourist operators, and other stakeholders were positive and progressive.

The audit team recommends that the Minister of Natural Resources extend the term of SFL #550587 for an additional five years.

3.8.2 Concluding Recommendation

The audit team concludes that management of the NHF was generally in compliance with the legislation, regulations, and policies that were in effect during the term covered by the audit, and the NHF was managed in compliance with the terms and conditions of the SFL held by AbitibiBowater. Forest sustainability is being achieved, as assessed through the *Independent Forest Audit Process and Protocol*. The audit team recommends that the Minister extend the term of SFL #550587 for a further five years.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The audit confirms that the NHF is a well-managed forest. Technical aspects of forest management are completed in a highly satisfactory manner. Communication between the various stakeholders on the NHF is excellent and relations are professional, positive, and progressive. AbitibiBowater is satisfactorily meeting the terms and conditions of its contract. The OMNR is also meeting the overall responsibilities associated with its role in managing the NHF.

The audit team confirms that, based on the evidence reviewed, management of the NHF was in compliance with the legislation, policy, and regulations that were in effect during the 2003-2008 audit term. The NHF is being managed sustainably. Given the effective performance of AbitibiBowater in managing all aspects of the SFL for the NHF, the audit team recommends that the term of the SFL be extended for an additional five years.

This audit report identifies 13 recommendations relating to the management and administration of the NHF. Table 12 summarizes the recommendations and suggestions by each broad audit principle.

Table 12. Recommendations arising from the audit.

Principle 1: Commitment
Principle 2: Public Consultation and Aboriginal Involvement
Recommendation # 1: The terms of reference for the Timmins LCC shall be updated to reflect FMPM requirements and to describe how the Timmins LCC will be involved in the new Cochrane Area Forest.
Principle 3: Forest Management Planning
Recommendation # 2: The OMNR Northeast Region and District shall confirm satisfactory completion of progress checkpoints in sequence and in a timely manner. Recommendation # 3: The OMNR Region and District should abide by the review process and provide only one final list of required alterations.
Principle 4: Plan Assessment and Implementation
Recommendation # 4: The OMNR District should lead a process to review specific safety and environmental concerns on older water crossings on secondary and primary roads, and take action where warranted. Recommendation # 5: AbitibiBowater shall ensure that all harvest practices reflect the prescription as outlined in the silvicultural ground rules. Recommendation # 6: AbitibiBowater should explore opportunities to further reduce roadside slash in its winter harvest areas.

Recommendation # 7: AbitibiBowater and OMNR Region and District shall immediately develop an action plan to rehabilitate the poplar stands that have succumbed to the forest tent caterpillar infestation.

Recommendation # 8: AbitibiBowater shall ensure that all tree improvement activities occurring on the Nighthawk Forest are appropriately recorded in Table AR-8 of the annual report in accordance with the requirements of the Forest Management Planning Manual.

Principle 5: Systems Support

Principle 6: Monitoring

Recommendation # 9: The OMNR Districts shall review their Forest Operations Compliance Monitoring programs to ensure that adequate resources are available to meet their obligations. Districts shall regularly review and monitor their progress towards meeting their compliance monitoring targets and take immediate steps to address shortfalls. Further, districts must take more vigilance to ensure that all compliance reports are submitted within the timeframes outlined in the Forest Information Manual.

Recommendation # 10: Timmins and Cochrane Districts shall improve their level of communications and coordination when reporting on compliance monitoring matters for the Nighthawk Forest.

Recommendation # 11: AbitibiBowater and the qualified overlapping licensees shall ensure that all compliance reports are submitted within the timeframes prescribed in the Forest Information Manual and OMNR policies.

Recommendation # 12: AbitibiBowater shall provide analysis on the level of silvicultural success being achieved in the text of the annual reports being prepared for the Nighthawk Forest.

Recommendation #13: AbitibiBowater shall fully report the results of its free-to-grow surveys annually as per the requirements of the Forest Management Planning Manual.

Principle 7: Achievement of Management Objectives and Forest Sustainability

Principle 8: Contractual Obligations

Concluding Recommendation

The audit team concludes that management of the NHF was generally in compliance with the legislation, regulations, and policies that were in effect during the term covered by the audit, and the NHF was managed in compliance with the terms and conditions of the SFL held by AbitibiBowater. Forest sustainability is being achieved, as assessed through the *Independent Forest Audit Process and Protocol*. The audit team recommends that the Minister extend the term of SFL #550587 for a further five years.

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APPENDIX A – COMPARISON AND TREND ANALYSIS OF PLANNED VS. ACTUAL OPERATIONS

Note: Information in this report is appended as submitted by AbitibiBowater Inc.

AbitibiBowater
Nighthawk Forest SFL # 550587
Independent Forest Audit 2008

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Comparison and Trend Analysis of Planned versus Actual Forest Operations

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SB 20AUG08
S. M. BROS
ONTARIO

Prepared By: ____________________
Steve Bros, R.P.F.
Merin Forest Management

Date: 20 August 2008

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1.0 Introduction

A requirement used to monitor Forest Management Plan (FMP) objectives and strategies is a Comparison and Trends Analysis of Planned versus Actual Forest Operations. The analysis and report herein has been completed in accordance with Appendix C of the Independent Forest Audit Process and Protocol for the 2008 Independent Forest Audit (IFA) of the Nighthawk Forest (NHF).

The NHF is located within the Ministry of Natural Resources (MNR) districts of Timmins Cochrane, and Kirkland Lake and is administered from the Timmins District office. The NHF is managed under Sustainable Forest Licence (SFL) 550587 held by Abitibi Consolidated Company of Canada Ltd. During October 2007 Abitibi merged with Bowater Inc and formed a new company called AbitibiBowater. Under the terms and conditions of this merger all licences and contracts associated with the NHF remain under Abitibi Consolidated Company of Canada's name. Any reference to Abitibibowater or Abitibi Consolidated Company of Canada (Abitibi) is considered to be the same entity as holder of the SFL 550587. Moreover all forest management planning continues to be completed by Abitibi staff based in the Iroquois Falls Woodlands Office

This comparison and trends analysis provides a summary and analysis of the actual and planned forest operations during the 1993-2008 period on the three former forests that comprise the current NHF:

- Timmins Forest (former SFL #501800)
- Driftwood Forest (former SFL #501700)
- Timmins Management Unit (former Crown Management Unit)

The NHF was created from the amalgamation of the Timmins Management Unit (TMU), Driftwood Forest (DF) and Timmins Forest (TF) on April 1, 2003. A new FMP for the NHF was prepared and approved for implementation during the 2003 to 2008 operating period. This FMP followed the 1996 Forest Management Planning Manual (FMPM) and implemented the residual stand requirements of the Forest Management Guide for Natural Disturbance Pattern Emulation Guidelines (NDPEG, November 2001) as directed by the guideline phase in requirements.

Prior to this the DF and TF were both SFLs managed by Abitibi after their purchase of Donohue Inc in 2000. Donohue (now Abitibi) had prepared and implemented the 1998-03 FMPs for both forests under the 1996 FMPM. It is important to note that the majority of Donohue planning and forestry staff continued with Abitibi, providing a knowledge and consistency in planning and operations.

The TMU was a Crown Management Unit until April 1, 2001, after which it was managed by Abitibi but has only been licensed to Abitibi since June 2002 (when the SFL was signed). Therefore the MNR was responsible for all management and administration up to June 2002 and Abitibi was responsible for management after this date. Prior to 2002, operations followed the 1996 to 2001 FMP prepared by the MNR Timmins District

Abitibi prepared the 2001-06 FMP for the TMU, which was to be implemented for a two year period from April 1, 2001 to March 31, 2003 after which the TMU became part of the NHF and followed the Abitibi prepared 2003-08 FMP.

At various times during the period 1993-2008 there were as many as eleven different

overlapping licensees operating on the NHF. The balance of the wood is harvested by Abitibi or through negotiated business agreements with Domtar, Grant Forest Products, Norbord and Tembec. Abitibi also has business agreements with First Nations to harvest wood. Trees from the NHF provide a continuous supply of fibre to the following mills:
Abitibi – Iroquois Falls
Domtar McChesney – Timmins
Domtar – Espanola
Domtar - Ostrom
Tembec – Timmins & Cochrane
Norbord – Cochrane
Grant Forest Products – Timmins and Englehart
Little John Enterprises – Timmins

As well, mills such as Cheminis Lumber in Larder Lake and CutRite Firewood in Timmins receive an irregular supply of fibre as needed.

This Trends and Comparison Analysis is based on data, strategies, objectives and targets from the following reports:

- 1998-2003 RPFO for the NHF
- 1993-1998 RPFO for the TF and DF
- 1996-2001 and 1991-1996 RPFOs for the TMU
- 2003-2007 Annual Reports for the NHF
- 2003-2008 FMP for the NHF
- 1998-2003 FMP for the TF and DF
- 1996-2001 FMP for the TMU
- 1991-1996 TMP for the TMU

A significant limiting factor to the achievement of FMP objectives and targets towards the end of the review period are economic factors beyond the control of Abitibi. From mid 2005 to the present the Ontario forest industry has experienced mill closures unseen in recent history. The combination of the high Canadian dollar, high energy costs, the U.S. lumber dispute and a collapse of the U.S. housing market has been cited as the cause of periodic mill shutdowns, long term closures and complete mill closures. The result has been decreased harvest, and decreased levels of renewal. Although these trends are difficult to detect because they are occurring in the last few years of the last plan term they are present and will influence future trends.

2.0 Comparison and Trends Analysis

2.1 Summary of Total Area under Management

Table 1 and its associated bar graph Table 1 Figure 1 provide a summary of the total crown area under management. The amalgamation of the three former forests into the NHF created a much larger forest with increased ecological complexity as the clay belt was added to the more rocky Canadian Shield portions of the Boreal Forest. This required redefining the landscape into two distinct sub-units (NE2 and NE4) and the application of management assumptions and strategic directions were applied separately to each sub-unit.

Overall the total production forest area increased by 2.2 % while total forested land increased by 0.4 % from term one to term three. These changes can be attributed to FMP objectives/targets and improvements in technology outlined below.

- The target to reduce B&S/NSR/Below Regen Standard through improved assessment and silviculture treatments has lead to increased production forest as it is declared Free-to-Grow (FTG).
- The move to computer technology led to the conversion to digital Forest Resource Inventory (FRI) creating a more accurate FRI.
- The target to improve records lead to reviews of land ownership classifications in the inventory, leading to transfers of land due to errors in land ownership on previous FRI. The TMU contains a significant proportion of private lands having a varied tenure and management rights including: Crown timber rights with the right to practice forestry, Crown timber rights without the right to practice forestry; and, fee simple or no Crown rights where either the pine is reserved to the Crown or no trees are reserved to the Crown. The FRI updates included changes to the ownership codes to better reflect the varied tenure and management rights.
- The target to improve record keeping has lead to the elimination of errors in delineation or coding of water and park areas.

These objectives/targets and technological changes are reflected in the entire land base as described in the balance of this section.

Non Forested Other Land

The amount of non-forested other land has increased by 16.5 % from 1993 to 2003. Specific reasons for the differences, other than the fact that the area summaries from the different forests utilized different databases and were done at different timeframes by different individuals, were difficult to determine. A contributor to this was there were always significant problems with the TMU areas in the past (as cited in the 1961-81, signed in 1967, FMP), and some private land classification issues on the TF and DF. Aiding this difference was increased mining activity in the Timmins area as land was cleared for new mines, roads and gravel pits and corrections occurred to patented mining claims. As area was cleared and placed under permit it was classed as 'non-productive forest' and then over the second and third terms it was properly classified as 'non-forested other'.

Forested Non Productive Land

In terms of forested non-productive land the total area decreased by about 29 %. In addition to the reasons above, a large portion of this change is related to the new digital FRI produced for all three forests in the 1990's. Areas were redesignated to other site classes under the updated digital FRI. Also several areas were removed from productive forest as a result of the 1999 Ontario Living Legacy (OLL) strategy. Portions of these removals contained non-productive forests that were removed from the managed land base. These areas include on the DF Site #C1598 ; TF Site # P1610, C1603, C1604, C1596 and C1594; TMU Site #C1597.

Forested Productive

Protection forest increased by about 95% as permanent reserves for the protection of values were added and classified in the inventory during the second term. This is a direct result of FMP policies for integrated resource management and recognition of non-timber uses of the forest (e.g. wildlife, recreation, fisheries). Permanent reserves are usually reserves along lakes and rivers or areas set aside to protect other values that are not available for harvest.

The B&S/NSR/below regen standard area decreased by 85%. This is reflective of a primary objective of plans on the TF, TMU and DF in the first 2 terms to reassess and treat areas that were classified as B&S/NSR/below regen standard. Many backlog areas were assessed and, if required, were treated to ensure they reached FTG status allowing them to be returned to production forest in the inventory. Also contributing to the decrease in B&S/NSR/below regen standard was the substantial increase in depleted and recent disturbance classifications. The creation of this new category is a requirement of the 2001 Forest Information Manual (FIM) standards that came into effect at the end of the 98-03 plan term. Much of the area that was classified as B&S in earlier terms is now being classified as depleted/recent disturbance in the last term.

Area by species benefited from the increased silviculture program to address the backlog of B&S/NSR/below regen standard. White/Red Pine area, which are at their most northern range in the south part of the Timmins District, stayed relatively unchanged at very low levels with a long term objective to double the current area of White Pine and Red Pine. Jack Pine area remained constant while there was an 8% increase in Spruce as a result of natural Spruce regeneration and conversion of backlog Balsam areas.

Consequently, Balsam Fir area decreased by about 30% as much of this area after harvest was planted to Spruce. It is important to note that virtually all of the Balsam areas were infested by Spruce Budworm in the late 1970's and 80's. Part of the increase in Spruce can be explained by the objective in the first term to convert to conifer species less susceptible to cyclic insect infestations. The dramatic decrease in Balsam Fir from the first to second term illustrates this. In later plan terms the conversion of Balsam sites to other conifer species is considered an extreme option and is only used if there is a potential for a very high yield from other species. This explains the increase in Balsam Fir in the third term.

During the 1983 FMP the area surrounding the Abitibi River was deemed by the MNR to be vulnerable to flooding should more dams be constructed on the river. As such, no silviculture funding was to be used to regenerate these areas lest they be destroyed by high water sometime in the future. During the 1998 FMP this condition was deemed a low risk, and all areas of the DF were considered eligible for funding. The area identified as a silviculture funding "reserve" or "riparian boundary zone" during the 1983 FMP was coded as "By0". There has not been any Yellow Birch recorded to be on the DF to date, so that seemed an adequate identifier to designate those areas that were ineligible for silviculture funding during term 1 without confusing it with anything else. The decrease in "Yellow Birch" area in term 2 (i.e. the 1998 DF FMP) was a result of the normal forest unit being applied to all areas of the forest, resulting in a change to the forest units within the former riparian boundary zone identified as "By0".

Both Poplar and White Birch area showed increases in area by 28% and 30% respectively. This trend is a result of B&S/NSR/below regen standard areas reaching FTG, decreases in chemical tending to control hardwoods and an increase in natural regeneration of these species. Many Poplar and Poplar mixedwood stands were operated to meet increased hardwood demand by Grant Forest Products. The Soft Maple area increased while the other hardwood areas decreased mostly as a result of changes in FRI and allowing the areas to regenerate naturally.

As a general note several fires over the planning terms have influenced the total area by species as these areas were either planted to more conifer species (Spruce and Jack

Pine) or allowed to regenerate naturally.

2008 Independent Forest Audit
Table 1 - Summary of Total Area Under Management

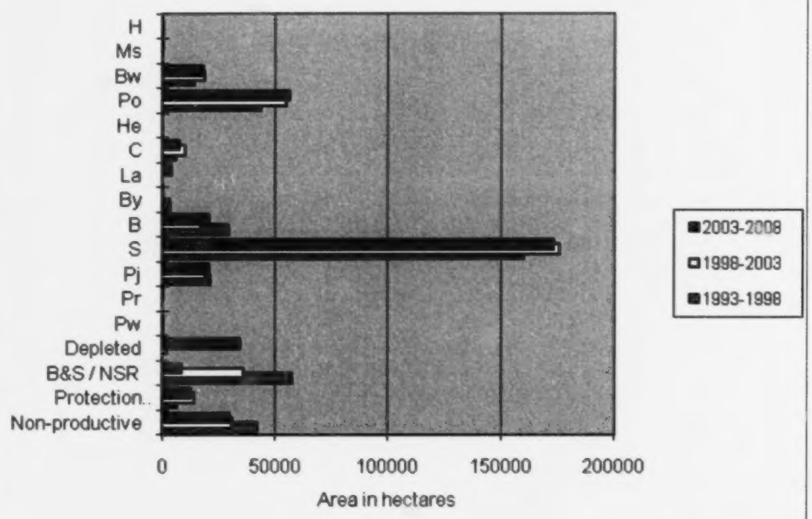
Past and Current Plans - Crown Managed

MU: Nighthawk Forest

		Area in hectares		
		Past Plans		Current
Land Type	Plan Term	1993-1998	1998-2003	2003-2008
Non-Forested				
Other Land		36,111	46,935	42,078
Forested				
Non-productive		41,903	30,924	29,738
Productive				
Protection		6,622	14,344	12,887
Production Forest				
B&S / NSR / Below Regen Standard		57,345	36,179	8,488
Depleted / Recent Disturbance		-	2,207	34,410
Forest Stands by Working Group or Provincial Forest Type				
Pw		118	91	109
Pr		-	-	6
Pj		21,397	19,324	20,917
S		160,145	175,544	173,092
B		29,354	17,385	20,562
By		3,724	-	42
La				4,148
C		6,252	10,198	7,726
He		-	-	-
Po		43,897	54,769	56,169
Bw		14,105	18,836	18,294
Ms		-	-	44
H		108	175	-
Total Production Forest		336,445	334,708	344,007
Total Forested Land		384,970	379,976	386,632

Note : Driftwood BYO was a Riparan Reserve for 1993-1998 periods

Table 1 Figure 1



Source: FMPM Table FMP-1, FMP-2
TMPM Table 4.8.2

2.2 Description of Forest Units

The following tables from 2 through to 2g illustrate the transition of 3 different sets of forest units as they have evolved on the TMU, TF, DF and their current form on the NHF. Table 2, shows the transition of forest units to their current status on the NHF. It describes how forest units from previous plan terms and different forests have formed the present day NHF forest units. Forest units have developed from units that did not adequately describe forest conditions within stands because there was no separation of mixedwood stands from pure stands to forest units that are linked to site types aiding yield projections to better plan volume targets when used in the Strategic Forest Management Model (SFMM). This is a necessity as a result of the:

- increased importance of conifer in hardwood stands for meeting economic objectives;
- increased economic importance of Poplar in the northeast region;
- need to use conifer dominated mixedwoods in meeting new habitat and ecological requirements and targets; and,
- increase in demand and new markets for underutilized species.

To understand the change in forest units it is important to note that from:

1. 1993-98 – forest units were based on working group and site class
2. 1998-03 – forest units were based on working group, species composition and site class
3. 2003-08 – forest units were based on species composition, stocking and site class.

The change in classification of stands into pure, mixedwood, and incidental forest units based on species composition increased the forest units from eight to thirteen on the TF and from six to nine on the DF during the second term.

On the TF, pure forest units included ppop1, ppop3, bwpur, pjpur, purhd, and splow, while mixedwood forest units included mxspf, mxdc1, mxdc2, and mxdha, while incidental forest units included othco, othwd, and pwrmx. For amalgamation purposes, the mxdco on the DF was equivalent to the mxdc1 on the TF, bamix and spupl were roughly equivalent to mxspf, while spru3 and splow were roughly equivalent to splow. The DF did not utilize mxdc2, bwpur, othco, othwd, pjpur, purhd or pwrmx due to relatively low amount of area in these site types in the forest. The TMU utilized a total of fifteen forest units according to standard forest units defined for the Northeast Region. For amalgamation purposes, the bw1 was equivalent to the bwpur used on the TF, mw1 was equivalent to the mxdc1, mw2 was equivalent to mxdc2, sp1 and sf1 were used instead of mxspf, lc1 was related to othco, lh1 and th1 were used instead of othwd, pj1 and pj2 were equivalent to pjpur, po1 was included with ppop1, sb1 was equivalent to splow, and the three Red and White Pine standard forest units were equivalent with the pwrmx forest unit on the TF. The TMU did not utilize the mxdha, ppop3, or purhd forest units.

The current NHF FMP utilizes the 16 standard forest units for the Northeast Region, with minor enhancements to identify areas of low quality Spruce and Poplar and separate Spruce dominated lowland conifer from other conifer dominated lowland. The Poplar and Spruce pure forest units were broken into productive (Sb1 and Po1) and less productive (Sb3 and Po3) forest units based on site class; and, Spruce dominated stands were removed from the LC1 forest unit and added to the Sb3 forest unit. The Xx forest unit designation was for protection forest islands that did not have FRI typing.

Overall, the forest unit definitions show an increase in complexity over time and reflect the differences in the types of stands being managed as well as the varying management practices on the nhf. The result has been that abitibi has been better able to identify conifer in all forest units ensuring a steady flow of this fibre leading to a better utilization of the landbase.

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MU: Nighthawk Forest

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8)

FU Mappings between Plan Periods

Trend Analysis FU	2003 NHK	2001 TMU	1996 TMU	1998 dri	1993 dri	1998 tim	1993 tim
bog	bog	bog					
bw1	bw1	bw1	bw1, bw0	mxdha		mxdha,bwpur,purhd	bwpur, bw 0
lc1	lc1	lc1	lc1, oc	othco		othco	othco
mw1	mw1	mw1					
mw2	mw2	mw2					
oh1	oh1	th1				othwd	othwd
pj1	pj1	pj1	pj1, pj x			pjpur	pjpur, pj 0
pj2	pj2	pj2	pj 3			mxdc2	
po1	po1	po1	po1, po 0	ppop1	ppop1, po1	ppop1	po 0
po3	po3	lh1	lh1, po3	ppop3	ppop3, po3	ppop3	ppop3, po 3
prw	prw	prw,pr1,pw1	prw			pwrmx	pwrmx, pw 0
sb1	sb1	sb1	sb1,sp x	splow		splow	splow
sb3	sb3		sp 3	spru3	spru3, spr3		spr 3
sf1	sf1	sf1	sf1, bf	bamix, mxdco	bamix, by0, ba1	mxspf	ba1, ba 0
sp1	sp1	sp1	sp1	spupl	spupl,spr1	mxdc1, mxdc2	sp1, spr 0

Table 2a DESCRIPTION OF FOREST UNITS (FMP-8) Nighthawk Forest 2003-2008

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria	Additions Information (Average Total Forest Conditions)
PRW	Red and White Pine	conifer mixedwood	pr and pw	**6, 3**	clearcut (claag)	pr >= 0.7 Or pw + pr + sw + he >= 0.4 And pw >= 0.3 Or pw + pr >= 0.4	Pw28 Sw15 Bw13 Pr12 Pj12 Bf12 Po6 Sb2 comp, 0.622 stk, sc1.1
OH1	Other Hardwood	hardwood mixedwood	uh and lh	**16, 15**	clearcut (claag)	lh >= 0.3 Or lh + mh + uh >= 0.3	Uh 28 Lh16 Bw16 Bf15 Sw15 Sb6 Po2 Ce2 comp, 0.622 stk, sc 3.15
BOG	Bog Unproductive	black spruce unproductive	sb	**14,** 1	clearcut (claag)	sb + la >=.7 And pw = 0 And sc ="4"	Sb92 La6 Ce2 comp, stock 0.695, sc 4
SB1	Black Spruce Pure SC x,1,2	pure black spruce	sb	**11, 8, 12,** 13, 9, 5, 1	clearcut (claag)	sb >= 0.8 And mh + uh + pr = 0 And pw + pj <= 0.1 And sc = "x" Or sb >= 0.6 And sb + ce + la >= 0.8 And pw +pj <= 0.1 And sc = "x" plus same syntax Or sc = "1" And sc = "2"	Sb89 La4 Bf3 Ce1 Po1 PjBwSw1 comp, 0.594 stk, sc 1.72
SB3	Lowland Black Spruce Pure SC 3	pure lowland black spruce	sb	**11, 12, 13,** 9, 5, 1	clearcut (claag)	sb >= 0.8 And mh + uh + pr = 0 And pw + pj <= 0.1 And sc = "3" Or sb >= 0.6 And sb + ce + la >= 0.8 And pj +pw <= 0.1 And sc = "3"	Sb91 La5 Ce2 Bf1 PoPjBwSw1 comp, 0.6 stk, sc 3
PJ1	Jack Pine Pure	upland conifer	pj	**2, 4, 3,** 1	clearcut (claag)	pj >= 0.7 And po + bw + mh + lh + uh <= 0.2	Pj91Sb5 Po3 Bw1 comp, 0.692 stk, sc 1.45
LC1	Lowland Conifer All SC	lowland conifer	sb, ce and la	**12, 13,** 1, 9, 14	clearcut (claag)	ce + la + sb >= 0.8 And mh + uh + pr = 0 And pw + pj <= 0.1 Or ce + la >= 0.6	Ce 35% La 30% Sb 30% Bf 4% SwPj 1% comp, 0.628 stk, sc 2.19
PJ2	Pine Spruce Mixedwood	upland conifer mixedwood	pj and sb	**4, 3,** 1	clearcut (claag)	(pj + sb + pr >= 0.7 Or (pj >= 0.5 And pj + sb + sw + bf + he + pw + pr + ce + la >= 0.7 And bf + sw + he + pw + ce + la <= 0.2)) And pj >= sb	Pj55 Sb25 Po11 Bw5 Bf3 Sw1 comp, 0.779 stk, sc 1.53
SP1	Spruce Pine Mixedwood	upland conifer	sb, sw, and pj	**9, 6,** 5, 8, 11, 14	clearcut (claag)	sb + sw + bf + ce + la + pw + pj + pr + he >= 0.7 And (bf + ce + pw + la + sw + he <= 0.2 Or pj >= 0.3)	Sb60 Po12 Bf10 Pj9 Bw6 Sw2 CeLa1 comp, 0.739 stk, sc 1.54
SF1	Spruce Fir Mixedwood	upland conifer	bf, sb and sw	**9, 6,** 3, 1, 14	clearcut (claag)	sb + sw + bf +ce + la + pw + pj + pr + he >= 0.7	Bf33 Sb30 Sw 17 Po7 Bw7 Ce4 La1 Pj1 comp, 0.669 stk, sc 1.27
PO1	Poplar Pure SC x,1,2	upland hardwood	po	**10, 6, 7,** 3, 1	clearcut (claag)	po + bw + mh + uh + lh >= 0.7 And po >= 0.5 And sc ="x" Or po + bw + mh + uh + lh >= 0.7 And po >= 0.5 And sc = "1" Or po + bw + mh + uh + lh >= 0.7 And po >= 0.5 And sc = "2"	Po79 Bw7 Sb5 Bf5 Sw3 Pj1 comp, 0.66 stk, sc 1.82
PO3	Poplar Pure SC 3,4	lowland hardwood	po	**10, 6,** 3, 1	clearcut (claag)	po + bw + mh + uh + lh >= 0.7 And po >= 0.5 And sc = "3" Or po + bw + mh + uh + lh >= 0.7 And po >= 0.5 And sc = "4"	Po77 Bw7 Sb7 Bf5 Sw2 Pj2 comp, 0.623 stk, sc 3.01
BW1	White Birch Poplar Mixedwood	mixedwood hardwood	bw and po	**6, 10, 7,** 3, 1, 16	clearcut (claag)	po + bw + mh + uh + lh >= 0.7	Bw68 Po15 Bf6 Sw5 Sb4 Pj2 comp, 0.582 stk, sc 2.25
MW1	Mixedwood Jack Pine	mixedwood	pj, sb, po and bw	**3,** 1	clearcut (claag)	pj + pr >= 0.2	Po33 Pj32 Bw15 Sb10 Bf5 Sw4 PrPwCe1 comp, 0.818 stk, sc 1.88
MW2	Mixedwood Spruce Poplar	mixedwood	sb, pj, po and bw	**6,** 1, 16	clearcut (claag)	Whats Left	Po31 Bw19 Bf18 Sb17 Sw12 Ce2 PjPwCe1 comp, 0.705 stk, sc 1.94
XX	No working Group	spruce* protection forest islands	sb*	na	clearcut (claag)	wg = XX	no FRI attributes

Source: SFMMTOOL Sort Criteria

* Site Types listed in order of prevalence and bold denotes most representative site types.

Table 2b - DESCRIPTION OF FOREST UNITS (FMP-8)

Driftwood Forest 1998-2003

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria	Additiona Information (Average Total Forest Conditions)
OTHCO	Larch & Cedar Working Groups	Other Conifer	La	13,9,12	none - no operations planned	La+Ce>0.6; La+Ce>0.5;Wg=Ce	681 ha ;La7Sb2Ce1;Stk-0.6; sc 2-3
SPRU3	Spruce Working Group site class 3	Conifer sc=3	Sb	11,12,8, 13,9,6b	Clearcut	Wg=Sb and SC=3	32359 ha ;Sb9La1;Stk-0.74; sc 3
SPLOW	Lowland spruce	conifer	Sb	11,12,8, 13,9	Clearcut	Sb=0.7 and Bf+Ce+La=0.3; Sb=0.7 and Bf+Ce+La=0.2 and Po+Bw=0.1; Sb=0.8 and Bf+Ce+La=0.2; Sb=0.9 and Bf+Ce+La=0.1; Sb>0.9; Sb=0.6 and Bf+Ce+La+Po+Bw=0.4; Sb=0.5 and Bf+Sw+Ce+La+Po+Bw=0.5; Wg=Sb	64402 ha; Sb8La1Bf1;Stk-0.78; sc 2
PPOP3	Pure Poplar site class 3	hardwood	Po	10,7a,7b, 6b,6a	Clearcut	Po>0.6 and sc = 3	1201 ha; Po7Sb2Bf1;Stk-0.88; sc 3
PPOP1	Pure Poplar site class x,1,2	hardwood	Po	10,7b,7a	Clearcut	Po>0.6 and sc = x, 1, 2	11614 ha; Po8Sb1Bf1;Stk-0.92; sc 2
BAMIX	Balsam dominated mixedwood	mixedwood	Bf	9,6b,6a, 8,5b,12	Clearcut	Bf>0.4 and Po + Bw <0.3	6389 ha; Bf6Sb1Sw1Po1Bw1; Stk-0.76; sc x-1
MXDCO	Mixedwood conifer dominated	mixedwood	Sb	6b,9,10, 6a,8,7b, 12,11	Clearcut	Sb+Sw+Bf+La+Ce>0.5 and Sb+Sw+Bf+La+Ce<0.8	11225 ha; Sb3Bf3Sw1Po2Bw1; Stk-0.76; sc 1
MXDHA	Mixedwood hardwood dominated	mixedwood	Po	10,7a,7b, 6b,6a,9, 11	Clearcut with dbh limit of 12 cm on all conifer	Po+Bw>0.4 and Po+Bw<0.8; Po+Bw>0.7	9744 ha; Po4Bw2S[illegible]2Bf1Sw1; Stk-0.78; sc 2-3
SPUPL	Spruce upland	conifer	Sb	8,9,6b, 11,12	Clearcut	Sb+Sw+Bf>0.6 and La=0.0 and Ce<0.3 and Po+Bw<0.3; Wg = Sw	10812 ha; Sb7 Sw1Bf1Po1; Stk-0.79; sc 1-2

Table 2c - DESCRIPTION OF FOREST UNITS (FMP-8) Driftwood Forest 1993-1998

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria
Spr1	Spruce WG sc x,1,2	Upland Spruce	Sb, Sw	na	Clearcut	WG= Sb or Sw and SC= X,1 or 2
Spr3	Spruce WG sc3	Lowland Spruce	Sb, Sw, Oc, Ce or La	na	Clearcut	Wg=Sb or Sw and SC=3 or Wg=Oc, Ce or La all SC
Ba1	Balsam Fir	Balsam Fir	Bf	na	Clearcut	WG= Bf all SC
	Poplar WG SC x, 1, 2	Poplar Upland	Po	na	Clearcut	Wg=Po and SC=x, 1 or 2
Po3	Poplar WG SC 3	Poplar Lowland	Po	na	Clearcut	WG= Po and SC= 3 WG= Oh all SC
By0	Riparian Boundary	Riparian Boundary	All WGs	na	Clearcut	ALL WGs and all SCs in riparian boundary zone

Sources: FMP-8 for recent plans and plan text for older plans

Table 2d - DESCRIPTION OF FOREST UNITS (FMP-8) Timmins Forest 1998-2003

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria	Additions Information (Average Total Forest Conditions)
OTHCO	Larch & Cedar Working Groups	Other Conifer	Ce	13,6b,9	none - no operations planned	La+Ce>=0.5; La+Ce>0.4 and Wg=Ce or La	7,802 ha.;Ce5Sb3La2;Stk-0.77, SC=2
OTHWD	Yellow Birch and Soft Maple Working Groups	Other Hardwood	By, Ms	16	none - no operations planned	Wg=Yb or Ms	248 ha.;By4Bw2Sw2Sb1Bf1; Stk-0.77, SC=3
PWRMX	White and Red Pine Working Groups	Conifer	Pw, Pr	6b, 15	none - no operations planned	Wg=Pw or Pr	98 ha.;Pw3Bw3Bf2Sw1Po1; Stk-0.6, SC=1
PPOP1	Pure Poplar site class x,1,2	Hardwood	Po	10,7b,7a, 6c, 3b	Clearcut	Po>0.6 and sc = x, 1, 2	13,573 ha; Po8Bw1Sb1; Stk-0.89; sc 2
PPOP3	Pure Poplar site class 3	Hardwood	Po	6c,10,7a,7b, 3b 6b,6a	Clearcut	Po>0.6 and sc = 3	3034 ha; Po7Sb1Bf1Bw1;Stk-0.83; sc 3
BWPUR	Pure White Birch	Hardwood	Bw	6c,7b,15,10,3b, 7a	Clearcut	Bw>.6	3790 ha.;Bw8Bf1Sw1;Stk-0.84; sc 2.5
PJPUR	Pure Jack Pine	Conifer	Pj	2a,2b 4,1	Clearcut	Pj>.6 and Po+Bw<.2	13137 ha.;Pj9Sb1;Stk-0.90; sc 1.5
PURHD	Pure Hardwood	Hardwood	Po	6c,10,7a,7b	Clearcut	Po+Bw_Uh>.7	4129 ha.;Po5Bw3Bf1Sb1;Stk-0.82; sc 2.5
SPLOW	Lowland spruce	conifer	Sb	13,12,11,8,5a,5b	Clearcut	Sb>0.9 and sc-2 or 3 and Bf+Ce+La=0.1 or Sb=0.8 and Ce+La=0.2 and SC=2 or 3 or Sb=0.7 and Bf+Ce+La=0.3 and SC=3 or Sb=.6 and Ce+La=.4 or Sb=0.5 and Ce+La=0.5 or Wg= Sb and Bf=.1 and CE+La=.4 or Ce=.4 or Ce+La=.4	17489 ha; Sb8La1Ce1;Stk-0.74; sc 2.5
MXSPF	Mixed SPF	Mixed Conifer	Sb	9, 6b, 12, 13, 5b, 4, 5a,8, 2b	Clearcut	Sb+Sw+Bf+Pj+Pw>.5 and Po+Bw<.3 and Ce+La<.4 and Po+Bw<.3	51,746 ha; Sb6Pj1Bf1Sw1 Bw1;Stk=.77 sc 1.5
MXDC1	Mixedwood conifer dominated Site Class x and 1	Mixedwood	Sb	9, 6b,6c,3b,7b,2b, 10,6a,5a	Clearcut	Sb+Sw+Bf+Pj+Pw>0.5 and Sb+Sw+Bf+Pw+Pj<.8 Po+Bw>.2 and Po+Bw<.5 and SC= X or 1	11225 ha; Sb3Bf3Sw1Po2Bw1; Stk-0.76; sc 1
MXDC2	Mixedwood conifer dominated Site Class 2 and 3	Mixedwood	Bw**	6c, 7b,3b,9,6b 2b,1,10	Clearcut	Sb+Sw+Bf+Pj+Pw>0.5 and Sb+Sw+Bf+Pw+Pj<.8 Po+Bw>.2 and Po+Bw<.5 and SC= 2 or 3	6988 ha; Sb2Bf2Pj1Sw1Bw3Po1; Stk-0.76; sc 2.5
MXDHA	Mixedwood hardwood dominated	Mixedwood	Bw	6c,7b,10,7a,3b 15	Clearcut	Po+Bw+Uh>0.4 and Po+Bw+Uh<0.8; Po+Bw>0.7	24007 ha; Bw3Po3Sb2Sw1Bf1; Stk-0.73; sc 2.5

**Was an error in the 1998 FMP - instead of Bw the main working group should be Sb

Table 2e - DESCRIPTION OF FOREST UNITS (Text in TMP)

Timmins Forest 1993-1998

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria
Spr 0	Spruce WG sc x,1,2	Upland Spruce	Sb, Sw	na	Clearcut	WG= Sb or Sw and SC= X,1 or 2
Spr 3	Spruce WG sc3	Lowland Spruce	, Sw, Oc, Ce or	na	Clearcut	Wg=Sb or Sw and SC=3 or Wg=Oc, Ce or La all SC
Ba 0	Balsam Fir SC X, 1, 2, 3	Balsam Fir	Bf	na	Clearcut	WG= Bf all SC
Pj 0	Jack Pine WG SC x, 1, 2, 3	Jack Pine	Pj	na	Clearcut	Wg=Pj all SC
Pw 0	White Pine WG SC x, 1, 2	White Pine	Pw	na	Clearcut	Wg=Pw and SC=x, 1 or 2
Po 0	Poplar WG SC x, 1, 2	Poplar Upland	Po or Pb	na	Clearcut	Wg=Po or Pb and SC=x, 1 or 2
Po 3	Poplar WG SC 3	Poplar Lowland	Po or Pb	na	Clearcut	WG= Po and SC= 3 WG= Oh all SC
Bw 0	Birch WG SC X, 1, 2, 3	Birch	Bw	na	Clearcut	Wg=Bw all SC

Table 2f - DESCRIPTION OF FOREST UNITS (FMP-8)

Timmins Management Unit 2001-2006

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria
PR1	Red Pine	Conifer	Pr	2	Clearcut CLAAG	pr>=.7
PW1	White Pine	Conifer	Pw	3	Clearcut CLAAG	pw+pr+sw+he>=.4 and pw>=.3
PRW	White and Red Pine	Conifer	Pw, Pr	3	Clearcut CLAAG	pw+pr>=.4
LH1	Lowland Hardwood	Hardwood	Ax, Po	15	Clearcut CLAAG	lh>=.3
TH1	Tolerant Hardwood	Hardwood	Ms, Mh	15,16	Clearcut CLAAG	lh+mh+uh>=.3
BOG	Spruce Bog	Conifer	Sb, La	14	Clearcut CLAAG	sb+la.=.7 and pw=0 and sc='4'
SB1	Black Spruce Lowland	Conifer	Sb	11, 8	Clearcut CLAAG	sb>=.8 and mh+uh+pr=0 and pw+pj<=.1
PJ1	Jack Pine	Conifer	Pj	2,3,4	Clearcut CLAAG	pj>=.7 and po+bw+uh+mh+lh<=.2
LC1	Lowland Conifer	Conifer	Sb, La, Ce	12,13,1,9,5	Clearcut CLAAG	sb+ce+la>=.8 and mh+uh+pr=0 and pw+pj<=.1
PJ2	Pine Spruce	Conifer	Pj, Sb	4,3	Clearcut CLAAG	(pj+sb+pr>=.7 or (pj>.5 and pj+sb+bf+sw+he+pw+pr+ce+la<=.2)
SP1	Spruce Pine	Conifer	Sb, Pj	9,6,5,3,11	Clearcut CLAAG	sb+sw+bf+pj+pw+pr+ce+la>=0.7 and (bf+ce+pw+la+sw<=.2 or p
SF1	Spruce Fir	Conifer	Sb, Bf, Sw, Ce	9,6,3,14	Clearcut CLAAG	sb+sw+bf+pj+pw+pr+ce+la>=0.7
PO1	Poplar	Hardwood	Po	10,6,7,3	Clearcut CLAAG	po+bw+mh+uh+lh>=0.7 and po>=.5
BW1	Birch Poplar	Hardwood	Bw, Po	10,6,7,3	Clearcut CLAAG	po+bw+uh+mh+lh>=0.7
MW1	Jack Pine Mixed	Conifer Mixedwood	Po, Bw, Pj, Bf	3	Clearcut CLAAG	pj+pr>=.2
MW2	Spruce Fir Mixed	Mixedwood	Po,Bw,Sb,Bf,Sw	6,1	Clearcut CLAAG	all remaining stands

Table 2g - DESCRIPTION OF FOREST UNITS (FMP-8) Timmins Management Unit 1996-2001

FU Code	FU Name	Forest Type	Main Working Group	Site Types*	Silv. System	FRI Parameters And Criteria
Sp X	Spruce x, 1, 2	Upland Spruce	Sb, Sw	na	Clearcut	WG= Sb or Sw and SC= X,1 or 2
Sp 3	Spruce 3	Lowland Spruce	Sb	na	Clearcut	Wg=Sb or Sw and SC=3
Bf	Balsam Fir	Balsam Fir	Bf	na	Clearcut	WG= Bf all SC
Pj X	Jack Pine X,1,2	Jack Pine	Pj	na	Clearcut	Wg=Pj SC X,1,2
Pj 3	Jack Pine 3	Jack Pine	Pj	na	Clearcut	Wg=Pj SC 3
OC	Other Conifer	Other Conifer	Ce, La, OC	na	Clearcut	Wg=Ce, La or OC all SC
Po 0	Poplar X, 1, 2	Poplar Upland	Po or Pb	na	Clearcut	Wg=Po or Pb and SC=x, 1 or 2
Po 3	Poplar 3	Poplar Lowland	Po or Pb	na	Clearcut	WG= Po and SC= 3
Bw 0	White Birch	Birch	Bw	na	Clearcut	Wg=Bw all SC

2.3 Summary of Planned and Actual Harvest Volumes

Table 3 and its associated bar graph Table 3 Figure 1 depict the annual planned and actual harvest volumes on the NHF and its predecessors (DF, TF and TMU) from 1993-2008. Please note that due to different planning horizons for the former TMU the period 1996-2008 are used for this trends analysis. Preparation of this table was completed by summarizing the totals and then annualizing them. The last term has only four years of data available because as of the completion of this report the fifth year annual report is not completed (due November 15, 2008).

Planned harvest increased 34% from term one to term three and can be attributed almost entirely to an increase in the allocation of Poplar and White Birch in the third term and an increase in the allocation of Balsam Fir starting in the second term. This was a result of an outbreak of forest tent caterpillar that attacked Poplar and White Birch trees and Spruce budworm that attacked Balsam Fir trees on the NHF and an associated objective to harvest as much of the affected area before the trees became unmerchantable.

The forest tent caterpillar outbreak persisted to the extent that annual growth over a five-year period (starting in 2001) was reduced and in some cases mortality occurred in Aspen stands. A total of 13,007 hectares on the NHF was considered to be high risk because they had been defoliated for two to three years or greater. An additional 4,186 hectares was considered dead having been defoliated over four years and some had also been defoliated as early as 2001. The Spruce budworm outbreak occurred in the 1970's and 1980's and has caused the death and decline of nearly all the Balsam Fir on the forest.

Total actual harvest volumes had virtually no change with about 1 % less harvested in term three compared to term one. In terms one and two the actual harvest was 3% and 9% lower respectively than the planned harvest. In the third term actual harvest was about 29% lower than planned. Although the final harvest areas have not been delineated for year five of term three, a lot of effort was put into finding companies willing and able to harvest the remaining FMP allocations, and so more area than average was harvested. This should result in an overall term three actual harvest less than the 29% annual averaged over the first four years. An objective of all plans has been an even flow of wood to local mills and based on actual harvest this has been achieved. The difference in the planned and actual harvest in term three is mainly due to bypass of dead Poplar, unmerchantable White Birch and poor quality Balsam Fir. The following paragraphs describe the reasons for the trends in planned volumes, actual volumes and planned versus actual volumes by species.

Planned Balsam Fir harvest increased by 450 % from term one to term three. The planned increase was a result of forest units with high components of Balsam Fir that were allocated through SFMM in order to maximize conifer volume from these stands. Accelerated harvest in Balsam Fir stands allowed for harvest of conifer and hardwood species before the impact of budworm declined the stand to the point that it could not be harvested economically. Furthermore, the strategy to harvest these species is a direct consequence of maintaining planned harvests of Jack Pine and Spruce relatively constant throughout the three terms to maintain a viable forest industry. In the first term the actual harvest of Balsam Fir exceeded the planned by 164% and in the second term it was 29 % less. This variability in harvest is due to the quality/merchantability of Balsam Fir and its incidence in allocated stands. Due to its marginal merchantability, in many locations, as a result of the Spruce Budworm outbreak it was only harvested if found to be merchantable. The first term actual harvest was likely higher because more merchantable Balsam Fir was obtained from mixed wood stands than planned. In the second term the opposite occurred. The incidence of unmerchantable poor quality Balsam Fir was higher and was therefore bypassed, this is also shown in Table 4 where area harvested in MW, Sb, SF and SP forest units are less in both terms but significantly less in the second term.

Cedar and Larch are incidental species that are harvested generally on road right of ways and in small volumes where a specialty market exists, therefore the relationship between planned and actual harvest can vary significantly. As with Balsam Fir, the planned harvest volume for Cedar and Larch increases from the first term to third term by 138% and from 0 to 1746 m^3 respectively. Again this is the result of allocation of more forest units containing Cedar and Larch with the objective to obtain the Spruce from these stands. In the first term the actual Cedar harvested was very low compared to planned and in the second term the opposite occurred. Larch harvest volumes were extremely low and insignificant in both terms.

Jack Pine is an extremely important and targeted species for the several sawmills that depend on the NHF for wood fibre. From the first term to third term the planned harvest decreased by about 0.4%, while the Jack Pine harvest was higher than planned by 27% in term one, by 81% in term two and by 27% in term three. This significant difference can be explained by several reasons:

1. Jack Pine harvested from salvage operations after Timmins Fire #12 in 1997.
2. A greater than expected recovery of Jack Pine from mixed wood stands.
3. Higher volumes of Jack Pine than indicated in the yield tables used for planning.

Spruce the most predominant species was constant throughout the three terms. From term one to term three planned Spruce harvest increased by about 10%. The planned Spruce harvest in the first term was almost the same (.06% lower) as the actual harvest. In the second term the planned harvest was 13% greater than the actual harvest and in the third term the planned harvest was about 12% higher than the actual. The lower harvest volumes are likely a result of lower yields than indicated, bypass of small unmerchantable Spruce in lowland harvest areas, the impact of HARP/HARO/CLAAG and the requirement to leave 25 trees/ha as part of the NDPEG requirements.

Planned White/Red Pine harvest volumes decreased by about 29% from term one to term three. As a species at its northern most limits in the Timmins District planned harvests are highly variable due to the small volumes and its scattered nature through other conifer stands. This variability also extends to harvest where White/ Red Pine harvest was 66% lower than planned in the first term, 97% higher in the second term and 91% lower in the third term. White/Red Pine is generally harvested as an incidental species on other forest units in the Timmins area. Furthermore at this very northern range for this species most trees do not produce high quality sawlogs or poles. Combine this with a small market demand and this explains the under harvest in the first term. The over harvest in the second term was a result of second pass harvesting, due to market demand, of a previous conifer area to obtain the White Pine.

Planned White Birch harvest increased by about 1828% from the first term to third term. As with other species that grow in mixed wood many of the mixed White Birch stands were planned for harvest to obtain the conifer, especially Jack Pine. The White Birch actual harvest in the first term was 38% lower than planned, 69% lower in the second term and 65% lower in the third term. Markets for White Birch during these terms were sporadic as its use in OSB, as fuelwood and pulp fluctuated. Also, due to dieback, branchiness and small size most of the White Birch was bypassed because of poor merchantability.

Planned Poplar harvest increased 27% from term one to term three. The actual Poplar harvest in the first term was 16% lower than planned, 32% lower in the second term and 51% lower in the third term. As mentioned at the start of this section this is a result of the tent caterpillar defoliation. Many stands harvested had considerably less merchantable volume due to tree mortality and consequently many areas were bypassed.

General factors that contributed to the lower overall actual harvest than planned applicable to all species include:

- There are numerous small parcels of Crown land surrounded by patent land found on the unit many of these areas being under-allocated or allocated and not harvested because of the difficulty in securing Crown access across patent land and the economic inefficiency in harvesting small, widely scattered land parcels.
- At the start of the analysis term many small operators did not always harvest their assigned blocks as they tended to focus on higher volume conifer and Poplar stands.
- An issue through all terms was the under or non utilization of Balsam Poplar and White Birch. This issue is a common problem related to the claybelt portions of the forest where Balsam Poplar thrives on the poorly drained clay sites and where White Birch productivity and form are lacking. White Birch is also a species that succumbs to dieback in these conditions.
- Operational targets that were added during operations to meet NDPEG.
- Areas bypassed due to access, terrain, and merchantability.

Of importance but not easily seen in the numbers is fulfilment of: 1) an objective in the early plan terms to increase utilization of tree species which are currently under utilized; and, 2) a requirement in the final FMP mandating that if there was greater than 40% crown closure in BW1 stands then there had to be a market for the White Birch before it could be harvested. Consequently, over the plan terms there has been an improvement in the utilization of Balsam Poplar, Balsam Fir, White Birch and pulp wood size Spruce in local mills and in Quebec based mills. For example the Grant Forest Products mill in Englehart can now accept Balsam Poplar and White Birch that was not possible through most of the first two plan terms. Without this increase in actual harvest numbers in the Balsam Fir, Poplar and White Birch would be lower.

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Table 3 - Summary of Planned & Actual HarvestVolumes

MU: Nighthawk Forest

Average Planned Annual HarvestVolumes

Volumes are Annualized for the Indicated 5 year period

	Volume in '000's cubic metres		
	Past Plans		Current
Former Timmins/Driftwood Former TMU Species	1993-1998 1996-2001	1998-2003 2001-2006	2003-2008
Bf	3,587	16,469	19,732
Ce	3,952	240	9,412
La	0	650	1,746
Oc	3,678	0	0
Pj	31,276	28,989	31,131
Sp	120,150	0	0
Sb	0	93,674	108,690
Sw	0	17,063	23,229
Bw	1,689	7,312	32,559
Po	74,731	68,199	95,168
Prw	2,434	224	1,730
Oh	0	124	924
	0	0	0
Total Planned Volumes	241,497	232,944	324,321

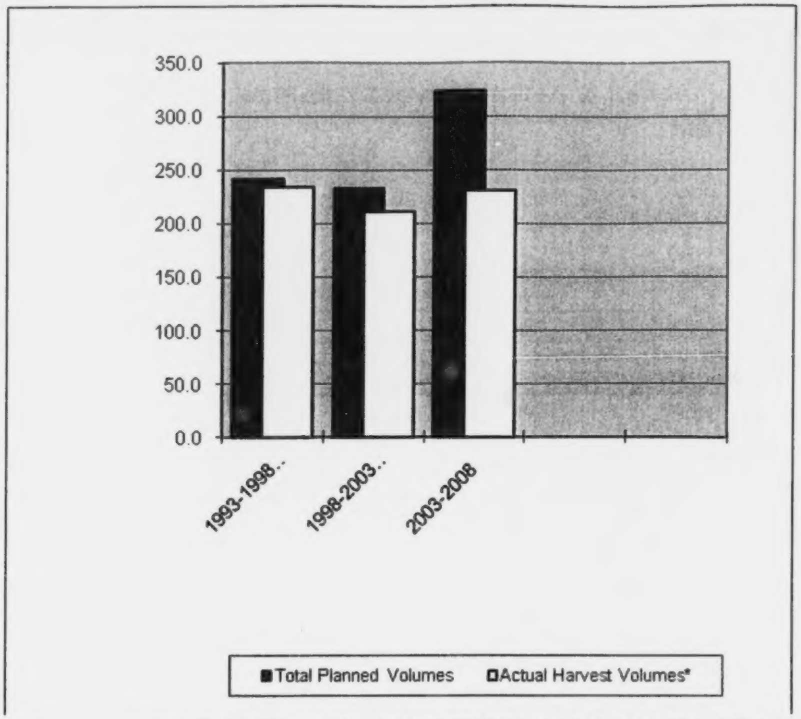
Actual HarvestVolumes

Volumes are Annualized for the Indicated 5 year period

	Volume in '000's cubic metres		
	Past Plans		Current
Former Timmins/Driftwood Former TMU Species	1993-1998 1996-2001	1998-2003 2001-2006	2003-2008
Bf	9,479.0	11,758.0	16,982.3
Ce	185.0	924.0	40.0
La	3.0	-	216.5
Oc	424.0	-	-
Pj	39,725.0	52,580.0	39,608.3
Sp	119,327.0	96,508.0	115,909.8
Prw	824.0	441.0	164.0
Bw	1,050.0	2,267.0	11,396.0
Po	62,479.0	46,721.0	46,480.8
By	30.0	11.0	-
Oh	17.0	-	12.8
Total Actual Volumes	233,543.0	211,210.0	230,810.3

Note: Current uses annualized data from 2003-07

Table 3 Figure 1



Source: planned: TMPM Table 4.18.1, 1996 FMPM Table FMP-21, 2004 FMPM FMP-17
actual TMPM Table 4.3.1, 1996 FMPM RPFO-4 and annual reports, 2004 FMPM AR-4

2.4 Summary of Planned and Actual Harvest Areas

Trend analysis Table 4 and its accompanying bar graph Table 4 Figure 1 illustrate a summary of planned versus actual depletion areas for the period 1993-2008. The overall planning trend and actual area harvested trend is downward. From the first term to second term the planned area decreased by 13 % and from the first term to the third term planned area decreased by 17%. This overall downward trend in planned area is a result of various factors.

1. Planned conifer (Spruce and Jack Pine) volumes are targeted to be constant and smooth, (as illustrated in Table 3 from term one to three) resulting in volume targets being met on less land area.
2. New provincial guidelines for Marten Core Habitat implemented in the second term have temporarily removed area from harvest for habitat.
3. NDPEG implemented in the final term have removed area from harvest to emulate natural fire patterns.

The first term actual total depletion area was 8% lower than planned, largely because of natural depletions; without natural depletions the area harvested would have been 31% less than planned. The increased natural depletion during this period is also a result of forest fire depletions for Timmins # 12 in 1997.

The second term actual depletion area was 34% less than planned, there were no natural depletions for this period. The third term actual depletion was 31% less than planned without natural depletions, with natural depletions it was only 2% less than planned. The increase in natural depletions in the third term can be attributed to Timmins # 19 in 2005. As noted in Table 3 the actual total harvest volumes were fairly constant through all three terms indicating higher yields were obtained on less harvest area.

The largest factor contributing to the decline in actual harvest area was the large area of bypass due to a lack of conifer sawlog volumes; poorer harvest chance or economic viability in lower volume hardwood stands and mixed wood stands; and, inoperability or unmerchantability. In the first term this was concentrated in the BW1, LC1 and SB3 forest units. The BW1 forest unit contains a significant number of smaller diameter White Birch that has no market around the Timmins area. The LC1 and SB3 forest units are generally lowland and poorly drained sites where trees are small and often unmerchantable. Moreover these forest units tend to have large concentrations of Larch and Cedar making them difficult to operate.

In the second term although the actual area harvested was less than planned there were a few exceptions. In the MW1, PJ1, PJ2 and SP1 the total area harvested from these areas was about 31% higher than planned. This area discrepancy can be explained by fire salvage from Timmins #12 in 1997.

In the third term actual harvest area was less in all species except Jack Pine where there was a 5% increase in actual versus planned harvest. This can be attributed to the salvage harvest in Timmins # 19 and the partial harvest of wind throw in 2005.

In all three terms the balance of the forest units (those other than MW1, PJ1, PJ2 and SP1) showed less area harvested than planned with the largest difference in LC1. There were also significant differences in the BW1, MW2, SB1, SB3 and SF1, PO1 and PO3. Although bypass was a large contributor to less harvest area other factors also contributed including:

- An increase in reserves - The increase was due to additional reserves added to protect new values, especially in the mixed forest units, for moose aquatics and stick nests not previously identified on the DF and TF;
- An increase in the selected wildlife species - At the start of the first term there were no selected wildlife species. By the second term plans there were three selected wildlife species habitat: marten, moose winter and moose summer;
- A change in harvest patterns - During the first term there was an emphasis on small well-distributed harvest blocks recommended in the moose habitat guidelines. A limit of clearcut size to 260 ha created a checkerboard pattern in large contiguous harvest blocks. During the second term harvest patterns were more natural. The 1998 FMP's included a cutover size objective with a natural disturbance frequency based on the Centre for Northern Forest Ecosystem Research (CNFER) data. This data indicated a typical fire pattern where area was burned through few large fires, typically in all age classes. The objective over time is to develop an age class distribution that mimics this;
- Poor yield and unreliable data in the Balsam working group - Resulted in an agreement with MNR to harvest merchantable stands as encountered; and,
- In the last 2 terms and particularly the third term Forest Tent Caterpillar defoliation of Poplar - To be considered sustainable, the planning team had to account for this landbase impact within the SFMM modeling. All management alternatives had the 4,186 hectares of Poplar Dead area adjustments utilized, except for the balanced management alternative. It was not adjusted to provide a management alternative that would consider the impact of the Poplar Dead. In

addition the 'poplar worst case' management alternative had an additional 13,007 hectares of high risk areas depleted to model the worst case scenario if the defoliation continues to kill the poplar in these stands.

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Table 4 - Summary of Planned & Actual Depletion Area

Past and Current Plans

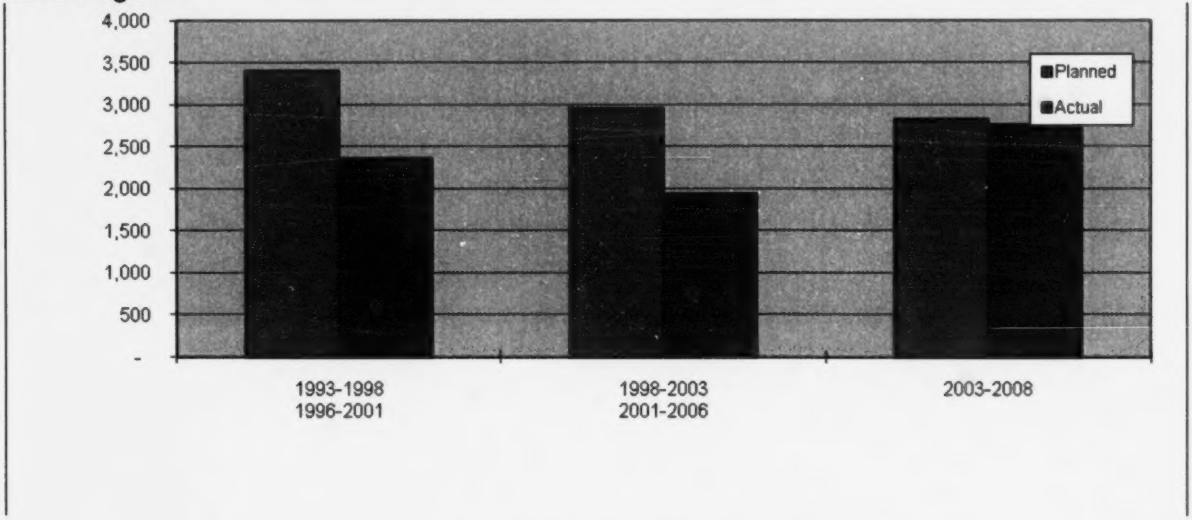
MU: **Nighthawk Forest**

Area is Annualized for the indicated 5 year period

Planned Annual Harvest Area					Actual Depletion Area					
		Area in hectares			*Area in hectares*					
		Past Plans		Current	Past Plans				Current	
Plan term	Former Timmins/Driftwood Former TMU	1993-1998 1996-2001	1998-2003 2001-2006	2003-2008	1993-1998 1996-2001	1993-1998 1996-2001	1998-2003 2001-2006	1998-2003 2001-2006	2003-2008	2003-2008
Forest Unit					Harvest	Natural	Harvest	Natural	Harvest	Natural
BOG										
BW1		213	560	87	125	67	472	-	82	15
LC1		120	66	132	10		6	-	42	9
MW1			17	68			32	-	41	2
MW2			87	531			29	-	435	8
OH1								-	-	-
PJ1		305	154	119	239	220	192	-	125	115
PJ2			71	64			122	-	48	13
PO1		581	347	456	425	46	201	-	181	162
PO3		77	24	63	52		29	-	17	1
PRW		30			20	4		-	-	-
SB1		1,538	211	478	1,181	302	64	-	395	406
SB3		93	578	273	21	3	300	-	129	19
SF1		448	633	366	286	126	256	-	275	70
SP1			203	188			236	-	162	12
	Total Area:	3,405	2,951	2,826	2,359	768	1,939	-	1,931	831

Note: Current uses annualized data from 2003-07

Table 4 Figure 1



Source: planned: TMPM Table 4.15, 1996 FMPM Table FMP-18 and 2004 FMPM FMP-15
actual: TMPM Table 4.1, 1996 FMPM Table RPFO-2 and annual reports; 2004 FMPM AR-1 and AR-6

2.5 Summary of Managed Productive Forest by Forest Unit

Trend analysis Table 5 provides a summary of Crown managed productive forest by forest unit and age class. Productive forest is comprised of protection forest and production forest. The unavailable portions of the crown production forest are those areas set aside for such things as permanent reserves.

The overall FMP objective regarding forest structure is to maintain the species composition and age class structure of the NE2 and NE4 sub-units on the NHF within the natural ranges and to maintain forest ecosystems, described in forest units, similar to the ranges that occur in a natural fire driven Boreal Forest based on the analysis of the historical condition while providing a sustainable flow of products from the forest.

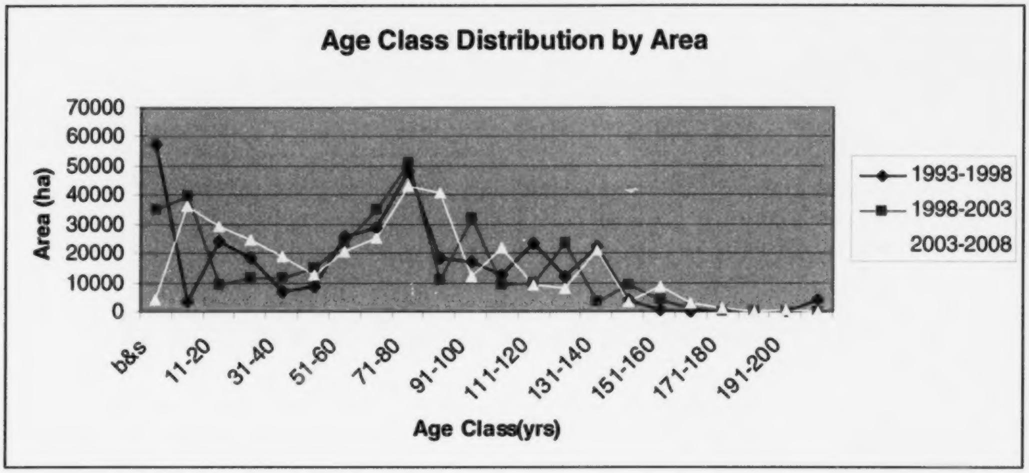
The Table 5 summary shows changes in forest unit area or age class distributions from forest management and natural occurrence. Harvesting, regeneration activities have had a major influence on the forest unit by age class distribution. However, there have also been other influences on forest unit and age class distribution that have had a significant impact, including the fact that:

- the DF, TF, TMU and NHF have all used different forest unit criteria during the reporting period;
- the inventory has been updated and changed as digital FRI was implemented;
- there have been many changes in land ownership from crown to patent as errors in the inventory were corrected;
- numerous areas have been removed from the land base because of OLL; and,
- there have been significant infestations of the Spruce Budworm in the conifer forest units and the Forest Tent Caterpillar in the hardwood units

Across all the forest units the trend that is evident is the available production forest has decreased by about 8% while unavailable production forest has increased about 392%. This has much to do with the numerous changes in forest management and new guidelines to protect values and emulate natural disturbance patterns and a shift in policy direction (i.e. Marten habitat vs. Moose habitat).

Table 5 is an extremely complex and difficult Table to interpret because of the amalgamation of the three different forests over the period of 1993-2008. To better illustrate age class trends a line graph was developed from this Table. The line graph Table 5 Figure 1 summarizes the total area in ha by age class over each plan term.

Table 5 Figure 1:

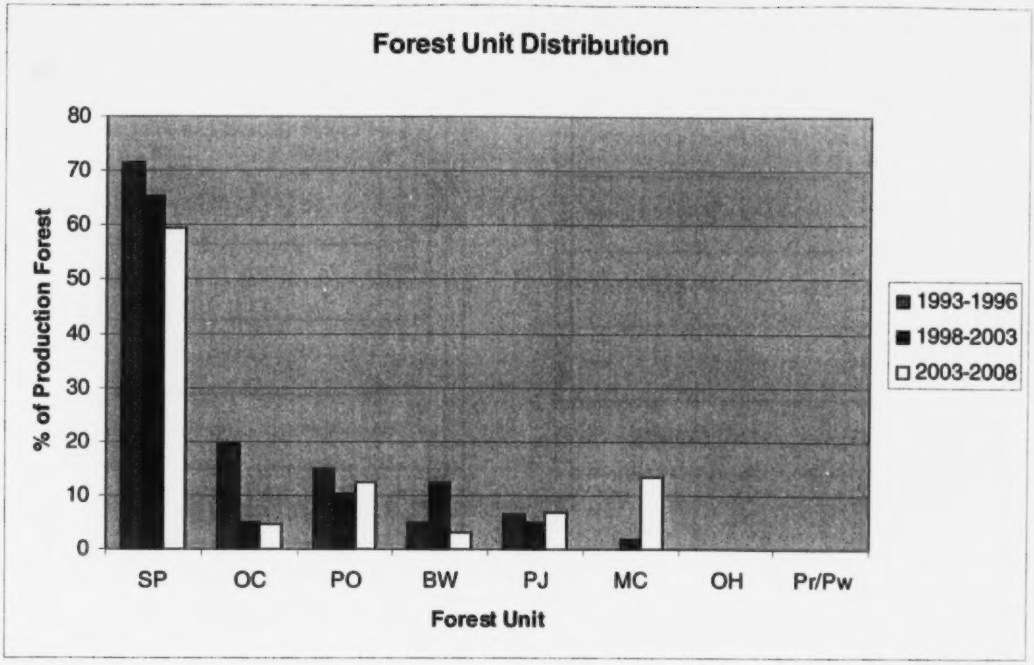


As far as age class distribution there has been a large decrease of 93% from the first plan term in the B&S age class as much of the area was assessed and treated and classified as FTG. There has also been an increase in area of older age classes (151+) from term one to term three of 995%. This can be attributed to the implementation of old growth policies and the requirement of the Marten Core Guidelines for old or mature forest. As a result of this increase in old age classes there has been a decrease in the 91-100 age class of about 41% and in age classes from 51-90 there has been an area decrease of about 8% as SFMM allocated these age classes (from 51-100) to compensate for those age classes left to meet old growth and wildlife targets. In the first two terms there was a significant drop in the 81-100 age class; by harvesting in younger age classes Abitibi has been able to maintain wood in mature age classes to move towards a sustainable forest age class distribution and ultimately a sustainable wood supply.

In the current NHF FMP the forest unit objective is to maintain forest ecosystems similar to the ranges that would occur in a natural fire driven ecosystem. The objectives and strategies developed for the FMP in the last term, with an emphasis on natural disturbances and landscape patterns, are quite different from the first term. Forest management planning has changed from having numerous small harvest blocks, to meet guidelines in place at that time, creating a fragmented forest versus today's larger harvest blocks that mimic natural disturbance patterns. This fact alone explains much of the change in age class distribution and forest unit distribution.

To better see trends by working group a bar graph Table 5 Figure 2 was developed from this Table. The bar graph summarizes the % of production area by forest unit compared to the total available and unavailable production forest by plan term. For easier interpretation, since so many different forest units have been used over the plan term, the forest units have been combined to represent the major species in that forest unit.

Table 5 Figure 2:



Analysis of the bar graph shows the Spruce forest unit decreasing over planning terms. This can be attributed to the increase in mixed conifer. Factors causing this shift include:

- Inventory related changes as harvested Spruce forest units have been moving into the mixed conifer because of an increase in natural regeneration;
- The Spruce forest units are being harvested using a combination of CLAAG/HARP/HARO and clearcut depending on site type. As CLAAG is normally left for natural regeneration some of these stands may be regenerating to a more mixed wood type stand because of an influx of other species such as Poplar, Balsam Fir and White Birch; and,
- On upland sites the decision not to spray as a result of public and First Nations pressure has likely had an impact on the success of artificial regeneration treatments. The result being more hardwood in the Spruce stands causing them to shift to a Mixed Conifer forest unit.

The change in the Other Conifer forest unit from the first term to the second and third term is likely due to inventory changes since the second and third terms are constant.

The Forest Tent Caterpillar infestation is directly responsible for the decrease in Poplar forest units, while the decrease in term two is likely due to not reporting natural regeneration.

The Jack Pine forest units have remained relatively constant due to a focus on ensuring Jack Pine levels for the local sawmills. The spike in White Birch forest units in the second term is difficult to explain and could simply be a result of implementation and correction of various inventories. The OH and Pr/Pw forest units account for less than 1% and therefore do not show up on the graph.

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MU: Nighthawk Forest

Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (1996 FMPM FMP-9 or 2004 FMPM FMP-4)

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
Forest Unit	Age Class	Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
BOG	bkts					n/a							n/a			0	0	0	0	n/a	0	0
	1-10					n/a							n/a			117	0	0	0	n/a	0	0
	11-20					n/a							n/a			0	0	0	0	n/a	0	0
	21-30					n/a							n/a			0	0	0	0	n/a	0	0
	31-40					n/a							n/a			35	0	0	0	n/a	0	0
	41-50					n/a							n/a			0	0	0	0	n/a	0	0
	51-60					n/a							n/a			34	0	1	0	n/a	0	0
	61-70					n/a							n/a			115	0	2	0	n/a	0	0
	71-80					n/a							n/a			470	2,390	24	120	n/a	0	0
	81-90					n/a							n/a			296	9,472	25	800	n/a	0	0
	91-100					n/a			23				n/a			288	16,416	8	456	n/a	0	0
	101-110					n/a							n/a			403	24,180	21	1,260	n/a	0	0
	111-120					n/a			110				n/a			1,000	60,000	35	2,100	n/a	0	0
	121-130					n/a							n/a			466	27,028	21	1,218	n/a	0	0
	131-140					n/a			51				n/a			2,631	147,336	151	8,456	n/a	0	0
	141-150					n/a							n/a			834	44,202	46	2,438	n/a	0	0
	151-160					n/a			9				n/a			1,766	86,534	53	2,597	n/a	0	0
	161-170					n/a							n/a			951	43,746	37	1,702	n/a	0	0
	171-180					n/a							n/a			551	23,142	6	252	n/a	0	0
	181-190					n/a							n/a			0	0	0	0	n/a	0	0
	191-200					n/a							n/a			11	385	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		0	0	193	0	0	0		0	0	9,968	484,791	430	21,399		0	0

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
Forest Unit	Age Class	Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
BW1	bkts			0		n/a	1,281		0	0	34	0	n/a	2,041	0	0	0	0	0	n/a	158	0
	1-10			2		n/a	0		12	0	18	0	n/a	859	0	39	0	0	0	n/a	2,652	0
	11-20			0		n/a	0		[illegible]	0	15	16	n/a	756	801	0	0	21	48	n/a	191	482
	21-30			0		n/a	403		21	105	21	173	n/a	1,022	8,464	0	0	1	7	n/a	153	1,071
	31-40			0		n/a	65		75	1,425	41	1,273	n/a	2,021	62,355	0	0	6	168	n/a	200	5,600
	41-50			0		n/a	265		41	2,192	58	3,239	n/a	2,870	158,707	0	0	9	450	n/a	256	12,800
	51-60			16		n/a	1,644		201	14,469	51	3,881	n/a	2,706	208,164	4	272	24	1,632	n/a	251	17,068
	61-70			32		n/a	1,877		404	29,930	148	12,306	n/a	7,189	602,978	8	672	54	4,536	n/a	623	52,332
	71-80			40		n/a	3,958		349	32,457	224	21,231	n/a	11,273	1,091,545	47	4,418	318	29,892	n/a	2,155	202,570
	81-90			13		n/a	1,677		32	3,104	32	3,373	n/a	1,633	165,282	0	0	263	24,985	n/a	1,581	150,195
	91-100			46		n/a	1,892		71	6,556	120	11,282	n/a	5,916	555,674	0	0	28	2,436	n/a	280	24,360
	101-110			0		n/a	650		56	4,803	15	1,358	n/a	776	66,548	0	0	89	6,853	n/a	825	63,525
	111-120			11		n/a	980		0	0	13	909	n/a	636	44,553	17	1,156	21	1,428	n/a	50	3,400
	121-130			0		n/a	391		0	0	17	846	n/a	811	41,474	0	0	40	2,320	n/a	96	5,568
	131-140			6		n/a	25		0	0	2	63	n/a	88	3,087	0	0	12	528	n/a	9	396
	141-150			0		n/a	112		0	0	0	37	n/a	65	1,853	0	0	0	0	n/a	0	0
	151-160			0		n/a	0		0	0	0	0	n/a	10	196	0	0	1	19	n/a	0	0
	161-170			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	171-180			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	63				n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		63	0	166	0		15,220	0	1,262	95,041	809	59,987		40,672	3,011,681	115	6,518	890	75,302		9,480	539,267

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
LC1	b&s					n/a	325		0	0	12	0	n/a	1,584	0	0	0	0	0	n/a	332	0
	1-10					n/a	0		129	0	5	0	n/a	251	0	27	0	0	0	n/a	381	0
	11-20					n/a	0		0	0	0	0	n/a	52	0	0	0	16	0	n/a	714	0
	21-30					n/a	52		0	0	1	0	n/a	53	0	0	0	34	0	n/a	612	0
	31-40					n/a	27		0	0	0	1	n/a	496	608	0	0	7	7	n/a	256	256
	41-50					n/a	0		0	0	2	19	n/a	123	926	0	0	8	16	n/a	221	442
	51-60					n/a	387		21	483	2	35	n/a	1,676	68,181	0	0	30	180	n/a	533	3,198
	61-70					n/a	0		5	205	17	661	n/a	819	32,397	0	0	50	1,400	n/a	743	20,804
	71-80					n/a	943		67	3,010	11	544	n/a	3,799	197,163	6	276	83	3,818	n/a	1,348	62,008
	81-90					n/a	15		0	0	0	40	n/a	28	1,968	36	2,196	140	8,540	n/a	1,489	90,829
	91-100					n/a	1,496		238	21,910	34	2,793	n/a	3,867	287,071	0	0	22	1,606	n/a	785	57,305
	101-110					n/a	78		151	14,206	15	1,492	n/a	700	73,110	217	16,709	401	30,877	n/a	2,221	171,017
	111-120					n/a	809		149	5,955	0	0	n/a	804	55,780	86	6,536	83	6,308	n/a	1,240	94,240
	121-130					n/a	495		505	55,045	38	4,076	n/a	1,843	199,729	98	7,252	26	1,924	n/a	417	30,858
	131-140					n/a	404		54	0	1	50	n/a	261	13,696	445	30,705	592	40,848	n/a	2,098	144,762
	141-150					n/a	898		37	2,902	3	238	n/a	134	11,790	8	512	8	512	n/a	223	14,272
	151-160					n/a	255		31	1,275	1	50	n/a	255	10,615	26	1,534	39	2,301	n/a	350	20,650
	161-170					n/a	4		57	4,332	0	56	n/a	59	4,092	14	770	6	330	n/a	80	4,400
	171-180					n/a	237		8	0	1	29	n/a	26	1,402	87	4,524	37	1,924	n/a	120	6,240
	181-190					n/a	44		0	0	0	0	n/a	0	0	0	0	13	611	n/a	15	705
	191-200					n/a	107		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	243		1		n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		243	0	1	0		6,576	0	1,452	109,323	143	10,082		16,829	958,489	1,050	71,014	1,595	101,202		14,178	721,986

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
MW1	b&s					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	1-10					n/a							n/a			0	0	0	0	n/a	21	0
	11-20					n/a			0	0	0	0	n/a	70	48	0	0	2	6	n/a	156	468
	21-30					n/a							n/a			0	0	1	18	n/a	386	6,948
	31-40					n/a			0	0	10	0	n/a	79	1,924	4	184	5	230	n/a	434	19,964
	41-50					n/a							n/a			0	0	30	2,340	n/a	187	14,586
	51-60					n/a			0	0	0	0	n/a	268	33,224	0	0	37	3,774	n/a	222	22,644
	61-70					n/a							n/a			6	774	46	5,934	n/a	397	51,213
	71-80					n/a			0	0	0	0	n/a	196	30,459	0	0	150	21,300	n/a	856	121,552
	81-90					n/a							n/a			25	3,625	288	41,760	n/a	984	142,680
	91-100					n/a			0	0	1	0	n/a	96	9,434	0	0	81	10,449	n/a	81	10,449
	101-110					n/a							n/a			0	0	114	12,312	n/a	276	29,808
	111-120					n/a			0	0	0	0	n/a	0	0	0	0	24	2,040	n/a	3	255
	121-130					n/a							n/a			0	0	0	0	n/a	0	0
	131-140					n/a			0	0	0	0	n/a	0	0	0	0	6	240	n/a	2	80
	141-150					n/a							n/a			0	0	0	0	n/a	0	0
	151-160					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	161-170					n/a							n/a			0	0	0	0	n/a	0	0
	171-180					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190					n/a							n/a			0	0	0	0	n/a	0	0
	191-200					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		0	0	0	0	11	0		709	75,089	35	4,583	784	100,403		4,005	420,647

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
MW2	b&a					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	1-10					n/a							n/a			0	0	0	0	n/a	11	0
	11-20					n/a			0	0	0	0	n/a	0	0	0	0	7	14	n/a	571	1,142
	21-30					n/a							n/a			2	18	54	486	n/a	1,686	15,174
	31-40					n/a			0	0	0	0	n/a	0	0	0	0	112	2,688	n/a	2,166	51,984
	41-50					n/a							n/a			24	1,032	225	9,675	n/a	1,779	76,497
	51-60					n/a			4	0	4	0	n/a	36	1,175	81	4,698	498	28,884	n/a	2,761	160,138
	61-70					n/a							n/a			55	4,455	753	60,993	n/a	3,241	262,521
	71-80					n/a			0	0	0	0	n/a	1,526	122,464	334	31,396	1,329	124,926	n/a	5,347	502,618
	81-90					n/a							n/a			423	41,877	1,782	176,418	n/a	7,780	770,220
	91-100					n/a			5	0	0	0	n/a	3,345	333,750	26	2,418	476	44,268	n/a	1,393	129,549
	101-110					n/a							n/a			64	5,120	1,159	92,720	n/a	3,509	280,720
	111-120					n/a			0	0	0	0	n/a	206	18,363	11	781	362	25,702	n/a	802	56,942
	121-130					n/a							n/a			0	0	433	25,547	n/a	899	53,041
	131-140					n/a			0	0	0	0	n/a	16	488	0	0	452	22,600	n/a	1,061	53,050
	141-150					n/a							n/a			0	0	0	0	n/a	0	0
	151-160					n/a			0	0	0	0	n/a	0	0	0	0	4	144	n/a	21	756
	161-170					n/a							n/a			0	0	2	68	n/a	38	1,292
	171-180					n/a			0	0	0	0	n/a	0	0	0	0	1	32	n/a	36	1,152
	181-190					n/a							n/a			0	0	0	0	n/a	0	0
	191-200					n/a			0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		0	0	9	0	4	0		5,129	476,240	1,020	91,795	7,649	615,165		33,101	2,416,796

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
OH1	b&a					n/a	32		0	0	0	0	n/a	8	0	0	0	0	0	n/a	7	0
	1-10					n/a	0		0	0	0	16	n/a	10	774	3	0	0	0	n/a	14	0
	11-20					n/a	27		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	21-30					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	56	0
	31-40					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	41-50					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	51-60					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	61-70					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	1	34
	71-80					n/a	6		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	81-90					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	91-100					n/a	0		51	3,213	2	151	n/a	118	7,409	0	0	0	0	n/a	11	781
	101-110					n/a	0		0	0	0	8	n/a	6	370	101	7,676	33	2,508	n/a	60	4,560
	111-120					n/a	0		0	0	1	66	n/a	52	3,220	0	0	0	0	n/a	0	0
	121-130					n/a	56		0	0	0	0	n/a	0	0	0	0	8	600	n/a	3	225
	131-140					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	141-150					n/a	19		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	151-160					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	161-170					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	171-180					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		140	0	51	3,213	3	240		194	11,774	104	7,676	41	3,108		152	5,600

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
PJ1	bkts			0		n/a	1,079		0	0	49	0	n/a	3,092	0	0	0	0	0	n/a	212	0
	1-10			3		n/a	1,067		0	36	33	130	n/a	1,593	6,374	2	0	0	0	n/a	3,117	0
	11-20			0		n/a	3,343		9	0	25	0	n/a	1,864	514	0	0	75	75	n/a	2,683	2,683
	21-30			0		n/a	4,944		21	651	15	476	n/a	752	23,301	0	0	27	648	n/a	3,090	74,160
	31-40			0		n/a	1,603		0	0	22	1,412	n/a	1,178	77,484	5	295	39	2,301	n/a	1,711	100,949
	41-50			0		n/a	1,447		0	0	17	1,904	n/a	818	93,286	0	0	30	2,760	n/a	986	53,912
	51-60			4		n/a	2,319		0	0	27	3,705	n/a	1,760	237,433	0	0	44	5,148	n/a	1,298	151,866
	61-70			124		n/a	3,302		7	1,106	41	6,450	n/a	2,000	316,028	0	0	105	14,595	n/a	1,503	208,917
	71-80			233		n/a	2,351		0	0	29	3,459	n/a	1,384	234,486	20	3,120	264	41,184	n/a	1,949	304,044
	81-90			61		n/a	279		0	0	5	825	n/a	232	40,413	0	0	228	38,076	n/a	869	145,123
	91-100			30		n/a	78		0	0	18	1,820	n/a	665	95,238	0	0	71	12,212	n/a	102	17,544
	101-110			5		n/a	88		0	0	1	142	n/a	59	6,938	0	0	126	21,294	n/a	149	25,181
	111-120			13		n/a	38		0	0	0	0	n/a	0	0	0	0	6	864	n/a	1	144
	121-130			0		n/a	65		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	131-140			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	141-150			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	151-160			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	161-170			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	171-180			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	34				n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		34	0	473	0		22,003	0	37	1,793	282	20,321		15,397	1,131,497	27	3,415	1,015	139,157		17,270	1,084,523

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
PJ2	bkts					n/a							n/a	0	0	0	0	0	0	n/a	0	0
	1-10					n/a							n/a			0	0	0	0	n/a	66	0
	11-20					n/a							n/a	44	20	0	0	9	9	n/a	436	436
	21-30					n/a							n/a			0	0	21	315	n/a	710	10,650
	31-40					n/a							n/a	130	2,211	0	0	17	731	n/a	736	31,648
	41-50					n/a							n/a			15	1,065	37	2,627	n/a	229	16,259
	51-60					n/a							n/a	331	32,752	0	0	16	1,488	n/a	409	38,037
	61-70					n/a							n/a			0	0	41	4,715	n/a	519	59,685
	71-80					n/a							n/a	159	20,831	20	2,620	97	12,707	n/a	738	96,678
	81-90					n/a							n/a			0	0	200	28,200	n/a	595	83,895
	91-100					n/a							n/a	14	2,142	0	0	19	2,660	n/a	67	9,380
	101-110					n/a							n/a			0	0	98	13,230	n/a	224	30,240
	111-120					n/a							n/a	0	0	0	0	12	1,404	n/a	4	468
	121-130					n/a							n/a			0	0	0	0	n/a	6	540
	131-140					n/a							n/a	0	0	0	0	16	944	n/a	36	2,124
	141-150					n/a							n/a			0	0	0	0	n/a	0	0
	151-160					n/a							n/a	0	0	0	0	0	0	n/a	0	0
	161-170					n/a							n/a			0	0	0	0	n/a	0	0
	171-180					n/a							n/a	0	0	0	0	0	0	n/a	0	0
	181-190					n/a							n/a			0	0	0	0	n/a	0	0
	191-200					n/a							n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		0	0	0	0	0	0		678	57,956	35	3,685	583	69,030		4,775	380,040

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of	Available				Unavailable		Stage of	Available				Unavailable		Stage of	Available	
Forest Unit	Age Class	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)
P01	bkts			0		n/a	6,191		0	0	45	0	n/a	6,099	0	0	0	0	0	n/a	0	0
	1-10			0		n/a	2,472		0	0	21	0	n/a	1,035	0	0	0	0	0	n/a	6,704	0
	11-20			0		n/a	366		0	0	9	57	n/a	704	3,867	0	0	217	1,302	n/a	1,775	10,650
	21-30			0		n/a	1,483		0	0	23	588	n/a	1,123	28,814	0	0	69	1,863	n/a	1,130	30,510
	31-40			0		n/a	1,393		0	0	22	1,354	n/a	1,412	80,875	0	0	91	6,006	n/a	2,081	137,346
	41-50			0		n/a	1,904		0	0	22	2,443	n/a	1,072	119,715	0	0	132	14,520	n/a	876	96,360
	51-60			44		n/a	6,531		0	0	30	4,460	n/a	2,955	403,631	0	0	399	59,850	n/a	2,369	355,350
	61-70			86		n/a	8,164		43	7,697	103	17,392	n/a	5,028	852,211	0	0	562	101,722	n/a	3,511	635,491
	71-80			211		n/a	11,339		0	0	113	20,361	n/a	7,924	1,322,448	82	15,334	1,662	310,794	n/a	6,721	1,256,827
	81-90			109		n/a	2,054		0	0	27	4,700	n/a	1,306	230,313	0	0	1,397	244,475	n/a	4,473	782,775
	91-100			13		n/a	729		0	0	14	2,197	n/a	954	137,929	0	0	504	64,512	n/a	793	101,504
	101-110			123		n/a	439		0	0	6	834	n/a	303	40,846	0	0	139	10,008	n/a	344	24,768
	111-120			13		n/a	117		0	0	0	0	n/a	4	306	0	0	172	6,364	n/a	146	5,402
	121-130			19		n/a	404		0	0	0	0	n/a	11	367	0	0	1	27	n/a	9	243
	131-140			0		n/a	282		0	0	0	0	n/a	0	0	0	0	18	396	n/a	22	484
	141-150			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	151-160			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	161-170			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	171-180			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	574		753		n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		574	0	1,371	0		43,558	0	43	7,697	435	54,386		29,930	3,221,321	82	15,334	5,363	821,839		30,954	3,437,710

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of	Available				Unavailable		Stage of	Available				Unavailable		Stage of	Available	
Forest Unit	Age Class	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)	Management	(ha)	(m^3)
P03	bkts					n/a	0		0	0	6	0	n/a	535	0	0	0	0	0	n/a	211	0
	1-10					n/a	0		0	0	3	13	n/a	140	647	2	0	0	0	n/a	1,054	0
	11-20					n/a	40		0	0	3	0	n/a	134	0	0	0	41	246	n/a	184	1,104
	21-30					n/a	306		44	0	2	0	n/a	82	8	0	0	0	0	n/a	317	6,340
	31-40					n/a	394		15	330	0	3	n/a	6	129	0	0	1	46	n/a	126	5,796
	41-50					n/a	107		0	0	9	270	n/a	411	13,250	72	5,688	13	1,027	n/a	113	8,927
	51-60					n/a	607		6	450	2	162	n/a	103	7,989	0	0	24	2,688	n/a	221	24,752
	61-70					n/a	1,531		19	1,932	16	1,539	n/a	752	75,410	6	834	77	10,703	n/a	492	68,388
	71-80					n/a	1,574		0	0	21	2,511	n/a	1,056	123,054	15	2,130	155	22,010	n/a	947	134,474
	81-90					n/a	144		17	1,989	13	1,666	n/a	674	78,701	35	4,375	280	35,000	n/a	1,500	187,500
	91-100					n/a	135		0	0	0	96	n/a	44	4,700	0	0	151	12,382	n/a	666	54,612
	101-110					n/a	239		0	0	2	197	n/a	128	9,651	0	0	9	996	n/a	69	3,036
	111-120					n/a	79		0	0	0	0	n/a	0	0	0	0	17	425	n/a	101	2,525
	121-130					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	131-140					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	141-150					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	151-160					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	161-170					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	171-180					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	181-190					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a	12						n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	0	0		5,168	0	101	4,701	77	6,398		4,066	313,538	130	13,027	768	84,923		6,001	497,454

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
PRW	bdts			0		n/a	302		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	1-10			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	4	0
	11-20			0		n/a	20		0	0	0	0	n/a	17	0	0	0	0	0	n/a	6	6
	21-30			0		n/a	25		0	0	0	6	n/a	37	290	0	0	0	0	n/a	0	0
	31-40			0		n/a	0		0	0	0	0	n/a	33	4,191	0	0	0	0	n/a	0	0
	41-50			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	36	3,384
	51-60			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	61-70			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	71-80			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	81-90			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	91-100			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	101-110			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	8	1,496
	111-120			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	121-130			1		n/a	13		0	0	0	13	n/a	8	619	0	0	0	0	n/a	0	0
	131-140			0		n/a	12		0	0	0	0	n/a	13	2,847	0	0	3	462	n/a	18	2,772
	141-150			0		n/a	34		0	0	0	8	n/a	5	377	0	0	0	0	n/a	0	0
	151-160			0		n/a	0		0	0	0	0	n/a	0	0	0	0	4	572	n/a	5	715
	161-170			0		n/a	0		0	0	0	71	n/a	48	3,481	0	0	0	0	n/a	28	3,948
	171-180			13		n/a	0		0	0	0	0	n/a	0	0	0	0	28	3,920	n/a	22	3,080
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+					n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		0	0	14	0		406	0	0	0	0	98		161	11,806	0	0	35	4,954		127	15,401

		Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
Forest Unit	Age Class			Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
SBI	bdts					n/a	3,904		0	0	58	0	n/a	10,450	0	0	0	0	0	n/a	1,525	0
	1-10					n/a	0		12	0	518	0	n/a	25,396	0	0	0	5	0	n/a	16,142	0
	11-20					n/a	438		0	0	26	0	n/a	1,488	20	0	0	731	0	n/a	15,730	0
	21-30					n/a	129		0	0	39	42	n/a	1,884	2,050	0	0	120	120	n/a	10,160	10,160
	31-40					n/a	1,168		0	0	32	50	n/a	1,725	2,436	0	0	121	1,694	n/a	5,248	73,472
	41-50					n/a	26		0	0	69	276	n/a	3,377	13,508	0	0	179	5,549	n/a	3,943	122,233
	51-60					n/a	4,037		48	720	65	966	n/a	3,788	51,705	0	0	529	25,921	n/a	5,806	284,494
	61-70					n/a	74		45	1,305	81	2,676	n/a	3,936	131,121	0	0	578	43,928	n/a	5,453	414,428
	71-80					n/a	6,598		160	6,400	56	2,646	n/a	4,714	161,362	0	0	738	72,324	n/a	7,118	697,564
	81-90					n/a	80		0	0	41	2,913	n/a	2,030	142,728	0	0	827	92,624	n/a	6,083	681,296
	91-100					n/a	2,626		333	20,313	85	4,286	n/a	4,086	323,655	0	0	458	54,960	n/a	3,178	381,360
	101-110					n/a	226		203	14,007	46	3,761	n/a	2,247	184,288	0	0	706	86,132	n/a	4,018	490,196
	111-120					n/a	849		14	1,064	61	5,672	n/a	3,248	335,520	0	0	406	48,720	n/a	2,349	281,880
	121-130					n/a	164		529	41,262	171	14,623	n/a	8,402	716,511	0	0	384	44,160	n/a	2,713	311,995
	131-140					n/a	160		0	0	34	3,225	n/a	1,815	170,928	0	0	1,444	160,284	n/a	7,396	820,956
	141-150					n/a	231		28	2,100	128	11,245	n/a	6,253	551,022	0	0	223	23,192	n/a	1,514	157,456
	151-160					n/a	65		0	0	42	3,304	n/a	2,032	165,627	0	0	748	74,052	n/a	5,188	513,612
	161-170					n/a	0		0	0	17	1,206	n/a	809	59,092	0	0	177	16,638	n/a	1,311	123,234
	171-180					n/a	8		0	0	1	53	n/a	40	2,612	0	0	97	8,536	n/a	769	67,672
	181-190					n/a	0		0	0	5	274	n/a	249	13,442	0	0	7	567	n/a	38	3,078
	191-200					n/a	0		0	0	1	44	n/a	65	2,134	0	0	46	3,496	n/a	263	19,988
	201+	174				n/a							n/a			0	0	3	213	n/a	38	2,698
rest Unit Subtotal		174	0	0	0		20,783	0	1,372	87,171	1,576	57,261		88,034	3,029,762	0	0	8,527	763,110		105,983	5,457,772

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
SB3	b&s					n/a	0		0	0	0	0	n/a	1,883	0	180	0	0	0	n/a	1,075	0
	1-10					n/a	0		206	0	52	0	n/a	2,531	0	0	0	3	0	n/a	3,014	0
	11-20					n/a	0		0	0	9	0	n/a	465	0	0	0	212	0	n/a	392	0
	21-30					n/a	0		0	0	3	0	n/a	158	0	0	0	4	0	n/a	343	0
	31-40					n/a	0		0	0	9	18	n/a	435	870	0	0	0	0	n/a	606	0
	41-50					n/a	216		11	22	10	41	n/a	1,004	2,007	0	0	23	0	n/a	524	0
	51-60					n/a	0		88	352	12	47	n/a	990	2,361	0	0	58	0	n/a	1,053	0
	61-70					n/a	111		422	2,532	67	402	n/a	3,286	19,716	0	0	32	32	n/a	650	650
	71-80					n/a	460		131	917	24	165	n/a	1,154	8,067	0	0	313	1,878	n/a	2,995	17,970
	81-90					n/a	155		313	9,703	26	802	n/a	1,268	39,312	0	0	81	2,673	n/a	1,339	44,187
	91-100					n/a	92		206	8,858	13	578	n/a	658	28,318	0	0	81	4,860	n/a	1,336	80,160
	101-110					n/a	151		551	28,101	19	968	n/a	923	47,074	0	0	175	11,550	n/a	1,682	111,012
	111-120					n/a	747		455	25,480	35	1,948	n/a	1,704	95,436	0	0	128	8,064	n/a	1,484	93,492
	121-130					n/a	399		2,196	136,152	65	4,019	n/a	3,176	196,923	0	0	199	12,338	n/a	1,742	108,004
	131-140					n/a	3,590		768	48,384	20	1,241	n/a	965	60,814	0	0	494	29,640	n/a	4,122	247,320
	141-150					n/a	0		1,672	105,336	31	1,927	n/a	1,499	94,462	0	0	169	9,464	n/a	894	50,064
	151-160					n/a	0		1,351	85,113	22	1,386	n/a	1,078	67,914	0	0	113	5,876	n/a	1,384	71,968
	161-170					n/a	0		684	41,724	2	106	n/a	85	5,201	0	0	79	3,871	n/a	824	40,376
	171-180					n/a	0		0	0	0	0	n/a	0	0	0	0	9	405	n/a	80	3,600
	181-190					n/a	0		11	605	0	0	n/a	4	220	0	0	0	0	n/a	0	0
	191-200					n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	4	148
	201+					n/a							n/a			0	0	0	0	n/a	0	0
						n/a							n/a			0	0					
rest Unit Subtotal		0	0	0	0		5,921	0	9,065	493,279	419	13,648		22,866	668,695	180	0	2,173	90,651		25,543	868,951

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
SF1	b&s			0		n/a	5,741		0	0	155	0	n/a	8,306	0	0	0	0	0	n/a	278	0
	1-10			37		n/a	15		20	0	69	0	n/a	3,370	0	2	0	3	0	n/a	3,003	0
	11-20			0		n/a	217		0	0	61	0	n/a	2,975	44	0	0	137	0	n/a	3,673	0
	21-30			0		n/a	151		215	1,720	115	1,009	n/a	5,641	49,437	0	0	28	84	n/a	2,332	6,996
	31-40			0		n/a	150		7	245	50	1,363	n/a	2,827	79,758	9	162	124	2,232	n/a	2,817	50,706
	41-50			16		n/a	747		18	1,152	78	4,331	n/a	3,816	212,218	7	238	347	11,798	n/a	1,993	67,762
	51-60			71		n/a	2,910		105	8,188	119	9,486	n/a	6,727	528,252	22	1,166	819	43,407	n/a	2,097	111,141
	61-70			203		n/a	5,329		51	4,647	169	16,381	n/a	8,252	802,656	0	0	1,191	89,325	n/a	2,931	219,825
	71-80			520		n/a	10,848		50	5,050	170	17,326	n/a	9,707	981,929	9	855	1,169	111,055	n/a	3,359	319,105
	81-90			425		n/a	6,162		0	0	42	4,912	n/a	2,046	240,676	0	0	1,526	163,282	n/a	4,642	496,694
	91-100			220		n/a	2,245		4	428	146	15,460	n/a	7,384	787,969	20	2,300	300	34,500	n/a	769	88,435
	101-110			27		n/a	831		0	0	50	5,220	n/a	2,476	255,780	29	3,335	882	101,430	n/a	2,742	315,330
	111-120			5		n/a	467		0	0	19	1,689	n/a	1,112	93,570	10	1,100	298	32,780	n/a	932	102,520
	121-130			0		n/a	272		37	2,627	117	8,288	n/a	5,697	406,117	0	0	330	31,680	n/a	558	53,568
	131-140			0		n/a	323		0	0	2	121	n/a	171	8,784	8	672	818	68,712	n/a	1,499	125,916
	141-150			0		n/a	0		0	0	12	573	n/a	588	28,059	0	0	76	5,852	n/a	163	12,551
	151-160			0		n/a	0		0	0	2	61	n/a	80	2,979	0	0	38	2,736	n/a	193	13,896
	161-170			0		n/a	0		0	0	2	42	n/a	79	2,040	0	0	31	2,108	n/a	165	11,220
	171-180			0		n/a	4		0	0	0	0	n/a	14	262	0	0	14	910	n/a	70	4,550
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	107		883		n/a							n/a			0	0	0	0	n/a	0	0
																0	0					
rest Unit Subtotal		107	0	2,407	0		36,412	0	507	24,057	1,377	86,260		71,268	4,480,532	116	9,828	8,131	701,891		34,216	2,000,215

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
SP1	bkls			0		n/a	38,478		0	0	10	0	n/a	515	0	0	0	0	0	n/a	0	0
	1-10			26		n/a	19		0	0	77	0	n/a	3,842	0	0	0	0	0	n/a	0	0
	11-20			0		n/a	19,431		12	0	7	9	n/a	486	548	0	0	11	11	n/a	1,184	1,184
	21-30			5		n/a	10,583		0	0	15	112	n/a	717	5,500	0	0	67	469	n/a	3,015	21,105
	31-40			0		n/a	2,322		0	0	13	356	n/a	705	18,080	0	0	77	2,002	n/a	1,691	43,966
	41-50			12		n/a	3,942		0	0	23	1,102	n/a	1,106	53,974	3	141	48	2,256	n/a	773	36,331
	51-60			19		n/a	7,082		37	2,257	44	3,073	n/a	2,331	163,910	18	1,224	154	10,472	n/a	1,035	70,380
	61-70			22		n/a	7,982		58	4,466	65	5,899	n/a	3,171	209,060	0	0	279	26,226	n/a	1,997	150,118
	71-80			54		n/a	9,102		164	14,432	135	14,948	n/a	7,170	782,602	0	0	316	35,708	n/a	2,892	326,796
	81-90			57		n/a	7,097		0	0	29	3,031	n/a	1,414	148,541	0	0	405	50,625	n/a	2,160	270,000
	91-100			24		n/a	7,524		8	712	88	10,063	n/a	4,434	504,651	0	0	54	7,020	n/a	455	59,150
	101-110			151		n/a	9,400		0	0	26	2,789	n/a	1,256	136,645	0	0	400	50,800	n/a	1,572	199,644
	111-120			158		n/a	19,489		0	0	36	3,628	n/a	1,764	177,781	0	0	71	8,378	n/a	326	38,468
	121-130			204		n/a	9,636		0	0	65	4,818	n/a	3,189	236,076	0	0	63	6,615	n/a	191	20,055
	131-140			159		n/a	17,460		0	0	7	587	n/a	334	28,739	0	0	232	21,112	n/a	856	77,896
	141-150			178		n/a	2,258		0	0	6	430	n/a	306	21,050	0	0	7	567	n/a	73	5,913
	151-160			9		n/a	157		0	0	4	245	n/a	205	12,014	0	0	58	4,292	n/a	135	9,990
	161-170			0		n/a	58		0	0	0	0	n/a	24	1,294	0	0	0	0	n/a	21	1,470
	171-180			0		n/a	73		0	0	0	0	n/a	0	0	0	0	10	660	n/a	15	990
	181-190			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	191-200			0		n/a	0		0	0	0	0	n/a	0	0	0	0	0	0	n/a	0	0
	201+	5,427		2,652		n/a							n/a			0	0	0	0	n/a	0	0
rest Unit Subtotal		5,427	0	3,730	0		172,093	0	279	21,867	650	51,089		32,969	2,580,463	21	1,365	2,252	227,213		17,991	1,333,456

Forest Unit	Age Class	Past Plans														Current Plan						
		1993 TIM/DRI, 1996 TMU							1998 TIM/DRI, 2001 TMU							2003-2008						
		Protection Forest		Production Forest					Protection Forest		Production Forest					Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available				Unavailable		Stage of Management	Available	
		(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)	(ha)	(m^3)	(ha)	(m^3)		(ha)	(m^3)
All	bkls	0	0	0	0	n/a	57,333	0	0	0	368	0	n/a	34,514	0	180	0	0	0	n/a	3,798	0
	1-10	0	0	68	0	n/a	3,573	0	379	36	796	159	n/a	39,026	7,795	192	0	11	0	n/a	36,183	0
	11-20	0	0	0	0	n/a	23,882	0	21	0	157	82	n/a	9,054	5,859	0	0	1,482	1,711	n/a	27,695	18,055
	21-30	0	0	5	0	n/a	18,076	0	301	2,476	233	2,406	n/a	11,470	117,865	2	18	426	4,010	n/a	23,990	183,114
	31-40	0	0	0	0	n/a	7,122	0	97	2,000	199	5,828	n/a	11,047	330,923	53	641	600	18,105	n/a	18,072	521,687
	41-50	0	0	28	0	n/a	8,344	0	70	3,366	287	13,624	n/a	14,597	667,592	121	8,164	1,081	53,018	n/a	11,516	509,493
	51-60	0	0	154	0	n/a	25,517	0	510	26,919	356	25,816	n/a	23,271	1,738,775	159	7,360	2,633	183,444	n/a	18,055	1,239,068
	61-70	0	0	467	0	n/a	28,370	0	1,054	53,820	706	63,705	n/a	34,434	3,121,578	190	6,735	3,770	364,109	n/a	21,661	2,144,406
	71-80	0	0	1,058	0	n/a	47,179	0	921	62,266	783	83,191	n/a	50,062	5,076,410	1,003	62,499	6,618	787,716	n/a	36,425	4,042,206
	81-90	0	0	665	0	n/a	17,663	0	362	14,796	217	22,202	n/a	10,630	1,087,934	815	61,545	7,442	907,458	n/a	33,495	3,845,394
	91-100	0	0	333	0	n/a	16,817	0	939	61,990	522	48,725	n/a	31,581	3,077,941	334	21,134	2,253	252,321	n/a	9,916	1,014,589
	101-110	0	0	306	0	n/a	12,102	0	961	61,117	180	16,767	n/a	8,874	821,251	814	57,020	4,352	441,370	n/a	17,699	1,750,533
	111-120	0	0	200	0	n/a	23,575	0	728	32,499	164	13,912	n/a	9,530	824,529	1,124	69,573	1,635	144,577	n/a	7,438	679,736
	121-130	0	0	224	0	n/a	11,895	0	3,267	235,086	472	36,683	n/a	23,138	1,797,815	564	34,280	1,505	126,429	n/a	6,634	584,097
	131-140	0	0	165	0	n/a	22,256	0	873	48,384	66	5,286	n/a	3,663	289,383	3,084	178,713	4,238	354,222	n/a	17,119	1,475,756
	141-150	0	0	178	0	n/a	3,552	0	1,737	110,338	180	14,458	n/a	8,850	708,574	842	44,714	529	42,025	n/a	2,867	240,256
	151-160	0	0	9	0	n/a	477	0	1,391	86,388	71	5,045	n/a	3,660	259,346	1,792	88,068	1,058	92,589	n/a	7,276	631,587
	161-170	0	0	0	0	n/a	62	0	741	46,056	21	1,481	n/a	1,104	75,201	965	44,516	332	24,717	n/a	2,467	185,940
	171-180	0	0	13	0	n/a	322	0	8	0	2	82	n/a	80	4,276	638	27,666	202	16,639	n/a	1,112	87,284
	181-190	0	0	0	0	n/a	44	0	11	605	5	274	n/a	253	13,662	0	0	20	1,178	n/a	53	3,783
	191-200	0	0	0	0	n/a	107	0	0	0	1	44	n/a	65	2,134	11	385	46	3,406	n/a	267	20,136
	201+	6,622	0	4,289	0	n/a	12	0	0	0	0	0	n/a	0	0	0	0	3	213	n/a	38	2,698
rest Unit Subtotal		6,622	0	8,162	0		328,280	0	14,371	848,142	5,786	359,771		328,901	20,028,842	12,883	713,031	40,236	3,819,347		303,776	19,179,818

2.6 Summary Report of Renewal, Tending and Protection Operations

Table 6 provides the planned versus actual renewal, tending and protection activities from 1993-2008. Broad trends over the three terms show that actual planting has remained relatively constant; there has been a decrease in the use of strip cutting and seed tree cuts; and, a general decrease in the use of aerial chemical tending. These general trends can be explained through analysis of planned and actual numbers by each term described in the following paragraphs.

On the DF and TF silvicultural operations during the first term were performed by Donohue. Silvicultural activities include modified harvesting (i.e. careful logging), site preparation, stock production, planting, and tending. Both of these forests have had intensive site preparation and planting treatments as a result of the previous Forest Management Agreement (FMA) and subsequent SFL licence arrangements for renewal. The natural regeneration was distributed across all forest units, with the majority in the Sb forest unit. Often the company waited 5 or more years to adequately assess natural regeneration results to allow for natural ingress of trees onto the site. An emphasis on FTG surveys occurred at the start of the first term. Most of the FTG areas were reported after 15 years.

Much of the natural regeneration in the first term was derived from backlog area that was surveyed for FTG explaining the substantially higher natural regeneration figure than planned (about 230%). In addition increased emphasis on Poplar harvesting, which regenerates naturally, may also account for the increase in natural regeneration. Artificial regeneration was about 40% less than planned. Contributing to this difference between planned and actual is a focus on natural regeneration over artificial regeneration as a large portion of the Spruce harvest was on lowland sites where sites often regenerate naturally through layering of existing young trees after harvest. It is important to note that the area identified as natural regeneration is also a result of HARP/HARO/CLAAG which is used extensively on lowland Spruce sites.

Some of the planting on the old TMU was completed by the Boy Scouts and the Ice Chest Lake Cottagers Association due to specific requests from these groups for planting area due to their interests in regeneration.

Site preparation in the first term was about 36% less than planned because of inoperability of some sites, blocks not being harvested, bypass of unmerchantable trees, and changes in plans because sites appeared to have significant natural regeneration. Also during the first term on TF and DF the use of scarification for natural seeding and leaving seed trees in White Pine stands was implemented. The bulk of tending was in aerial chemical spraying and was only 9% less than planned.

In the second term natural regeneration was 70% less than planned while artificial regeneration was 2% higher than planned. The decrease in artificial regeneration is due to cutting less than planned and bypass of unmerchantable and inoperable areas.

Second term site preparation decreased significantly by about 71%. There was less site preparation as a result of the decrease in cut area, increase in natural regeneration and bypass of unmerchantable trees. The largest drop was 84 % in chemical site preparation. This was a result of efforts to decrease the cost of renewal, increased public and government pressure to reduce the amount of chemicals used, and the move towards more natural regeneration. A similar trend was shown in tending where aerial chemical spraying made up the bulk of the program. Aerial chemical spraying was about 32% less than planned due to efforts to reduce renewal costs and reduce the amount of chemical used in renewal efforts.

In the final term natural regeneration was 33% higher than planned. It is important to note that areas do not get recorded as natural regeneration until Abitibi is almost positive they are FTG. Consequently, artificial regeneration was 33% less than planned. The decrease in planting and increase in natural regeneration can also be attributed to less area available for planting than planned because of bypass and inoperable conditions due to wet ground and a worsening forest economy (all companies were forced to look at more cost effective methods of operation). Site preparation was 9% higher than planned. Mechanical was less as less area was available due to bypass and wet ground. Consequently chemical site preparation was 135% higher to partially offset this decrease. Tending was also 36% higher as a result of more aerial spraying. Actual tending figures reflect individual site conditions and the effort needed to reach silviculture success. Also in 2006 there was an unplanned 667 ha of seeding with site preparation completed as part of a Forestry Futures Trust Fund project to regenerate a burn area from 2005.

In all three terms there is very little of planned site preparation as hand scalp planting, an approved method under the silvicultural ground rules, was preferred treatment by Donohue and Abitibi. On many wet inaccessible sites this was the only practical and economic method to use in lieu of high cost mechanical site preparation. Most of the natural regeneration was through the use of clearcut with standards (i.e. the use of CLAAG). There was intensive silviculture carried out on the upland conifer sites (Black and White Spruce). The use of CLAAG, company policy at Donohue, was meant to ensure natural regeneration on lowland sites only. On upland Spruce or mixed conifer where it is apparent residual or advanced growth is minimal these sites were direct planted or site prepared and planted with an emphasis on the most expensive treatment on the more productive sites. The use of CLAAG and CLASP and a trend towards cut-to-length harvesting and careful logging techniques, especially on lowland sites, helped increase the success of natural regeneration.

Of note in the Timmins District was the curtailment of prescribed burns during the second term as a method of tending or site preparation due to MNR shift to full cost recovery. As a result prescribed burning was not a planned site preparation or tending technique on the NHF.

There was new renewal support during the second term as the Northeast Seed Management Association formed to manage all seed orchards in Timmins District. Three seed orchards (Ramore Jack Pine Breeding Zone 2, Island Lake Black Spruce Breeding Zone 4 and Evelyn Black Spruce Breeding Zone 4) were established for a source of seed for the NHF. This involvement helps meet the objective to improve tree genetics and seedling quality.

A contributor to differences between planned targets and actual results in all areas of renewal is the fact that these areas begin as one forest unit and often end up as another forest unit at the time of FTG. Actual field conditions always dictate the final silvicultural prescription. The Silvicultural Ground Rules (SGRs) included in the FMP provide a suite of prescriptions by forest unit that are designed to achieve a future forest condition. A measure of success in forest management is achieved when the SGR chosen for a particular site reaches the future forest condition stated. This is termed a silviculture success. When a site renews naturally or from artificial treatment to a future forest condition that is somewhat different from what was stated in the SGR. This is referred to as regeneration success. Once an area is depleted it receives a regeneration treatment from within the suite of SGRs for that forest unit. When that site reaches FTG the FTG assessment information reflects the efforts made employing the SGR in an effort to reach the future forest condition. At the end of the day the FTG information reflects the current forest condition achieved. A comparison of the trends in Table 1, and forest unit by age class in Table 5 is a testament to how successful renewal efforts have been in achieving silviculture success and subsequently objective success.

Based on the trends for renewal, tending and protection the FMP objective to attempt to naturally regenerate harvested sites, through harvest pattern layout, maximizing efforts to preserve advanced growth and by allowing sufficient time for sites to adequately respond to treatments with artificial regeneration on as needed basis where probabilities of natural regeneration is low, is being met.

APPENDIX B – AUDIT TEAM MEMBERS AND QUALIFICATIONS

Craig Howard, R.P.F., CEA (SFM) – Lead Auditor

Education: B.Sc. Forestry, University of New Brunswick, 1983.
Experience: 25 years experience in forestry, 12 years in private practice, 3 years in the OMNR.
Previous Audits: 15 Independent Forest Audits, 10 Sustainable Forest Initiative Verifications, 2 Forest Stewardship Council Assessments.

Mark Leschishin, R.P.F – Forester

Education: B.Sc. Forestry, Lakehead University, 1978. Dip. For. Tech., 1974.
Experience: 27 years experience in forestry in Ontario.
Previous Audits: 10 Independent Forest Audits.

Tom Clark – Ecologist

Education: M.Sc., H.B.Sc.
Experience: Forest ecologist and biologist with 26 years experience in habitat ecology.
Previous Audits: 17 Independent Forest Audits, and numerous Forest Stewardship Council assessments and audits.

Phil Shantz – Socio-economist

Education: M.E.S, R.P.P.
Experience: Registered professional planner with 14 years experience in forest auditing/certification, resource and socio-economics, land-use planning and public consultation.
Previous Audits: 11 Independent Forest Audits, 11 Forest Stewardship Council Assessments.

Brian Callaghan, R.P.F. – Forest Management Planning Analyst

Education: B.Sc.F., University of Toronto, 1982.
Experience: 24 years experience in forestry in Ontario.
Previous Audits: 19 Independent Forest Audits, 12 Sustainable Forest Initiative Verifications, 9 Forest Stewardship Council Assessments.

APPENDIX C – INDEPENDENT FOREST AUDIT GUIDING PRINCIPLES

Commitment	Commitment is reflected in vision, mission and policy statements of the Company and adherence to legislation and policies. Vision and mission statements are intended to provide long-term guidance for the organization. Policy statements reflect how the organization's vision and mission will be achieved. These statements must be reflected in the day-to-day operations of the organization.
Public Consultation and Aboriginal Involvement	The process of sustainable forest planning, implementation and monitoring must be conducted in an open consultative fashion, with input from all members of the planning team, Local Citizens Committee, Aboriginal communities groups, and other parties with an interest in the operations of the forest unit.
Forest Management Planning	The forest management planning process involves the input from all members of the planning team as well as public consultation and Aboriginal involvement to describe the current forest condition, values and benefits to be obtained from the forest, the desired condition of the forest in the future, and the best methods to achieve that goal. Planning requirements have been established which must be followed by all forest management units.
Plan Assessment and Implementation	Verification of the actual results of operations in the field compared to the planned assumptions and planned operations is required to be able to assess planning as well as the effective achievement of plan objectives and compliance with laws and regulations.
Systems Support	System support concerns resources and activities needed to support plan development implementation so as to achieve the desired objectives. The organization's human resources and information management systems must support sustainable forest management. .
Monitoring	Monitoring programs must be developed and implemented to assess compliance and effectiveness of operations in relation to the FMP, laws, and regulations. Operations must be reported regularly and reporting must examine the effectiveness of these operations in achieving these objectives.
Achievement of Management Objectives & Forest Sustainability	Periodic assessments of the forest management unit operations must be made in order to determine whether management objective, including forest sustainability objectives, are being achieved. This includes comparing the values of the planned indicators against the actual values and assessing reasons for significant variation.
Contractual Obligations	The licensee must comply with the specific license requirements. Specific requirements, when relevant to MNR, must be followed.

APPENDIX D – LIST OF ACRONYMS USED

AHA – Available Harvest Area
AOC – Area of Concern
AWS – Annual Work Schedule
CFSA – Crown Forest Sustainability Act
CSA – Canadian Standards Association
CLAAG – Careful Logging Around Advanced Regeneration
FMP – Forest Management Plan
FMPM – Forest Management Planning Manual
FOCIS – Forest Operations Compliance Information System
FRI – Forest Resource Inventory
FTG – Free-to-grow
GIS – Geographic Information System
GPS – Global Positioning System
HARP – Harvesting with Regeneration Protection
ISO – International Organizations for Standardization
LCC – Local Citizens' Committee
NHF – Nighthawk Forest
NRVIS – Natural Resources Values Information System
OMNR – Ontario Ministry of Natural Resources
RPF – Registered Professional Forester
RPFO – Report of Past Forest Operations
SFL – Sustainable Forest License
SFMM – Strategic Forest Management Model
SGR – Silvicultural Ground Rule

APPENDIX E – SUMMARY OF INPUT TO AUDIT PROCESS

General Public: A survey was sent to 624 stakeholders on August 26 and 27 sing the mailing list that OMNR Timmins District maintains for the NHF. The audit team received 34 responses to the survey by mail and nine by email.

Local Citizens' Committee: The Timmins LCC as the lead LCC, they were the focus of audit protocol criterion associated with the LCC. All members of the Timmins LCC were offered the opportunity to provide input to the Audit. Two members of the Kirkland Lake LCC (including the Chair) and the Chair of the Cochrane LCC were also offered opportunities to provide input. No concerns were expressed by the other LCC's over the lack of involvement in the Nighthawk Forest Management Plan preparation. A total of ten Timmins LCC members provided input to the audit team via personal interviews or returned surveys. Both members of the Kirkland Lake LCC provided input.

Aboriginal Communities: Four First Nations (FN), Wahgoshig, Matachewan, Mattagami and Taykwa Tagamou (TTN) have a clearly defined interest in the Nighthawk Forest and participated extensively in the 2008 FMP preparation. A fifth First Nation, the Moose Cree, had identified an interest in a minor portion of the most northerly section of the forest and did not need to participate in consultation activities during the period of the audit. The Moose Cree have requested and received correspondence and planning information on the 2008 FMP.

Overlapping Licensees: Representatives from three overlapping licensees participated in the field visits. All, expressed support for the management activities of the AB and a slightly smaller number were supportive of the work of the OMNR.

Ontario Ministry of Natural Resources: The OMNR area foresters, area biologists, and technician participated in the opening and closing meetings of the field audit, as well as the field audit itself. The Timmins District Manager and Area Supervisor attended the opening and closing meeting, and a field day during the audit. Regional OMNR staff attended the opening meeting, two days in the field and the closing meeting in person. One main office OMNR staff attended three days of the field audit.

AB: The AB Forestry Superintendent, foresters, and supervisors participated throughout the audit.